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ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

American Railways and National Interests

SINCE the passing of the Emergency Railroad Act of 1933 and the appointment of Mr. Joseph B. Eastman as Federal Co-ordinator of Transportation, various steps tending towards the unification of American railway services and administration have been taken. The latest step is agreement by the railway executives to the formation of a central authority for dealing with matters of national importance. Upon this, Mr. Eastman has issued an approving statement, albeit with reservations. His remark that the move "is, of course, not a complete answer to the entire transportation problem" is no doubt a reflection of his advocacy of grouping, and may even be interpreted by some in the light of earlier statements which were judged as being not averse to nationalisation. He stresses the fact that although the railways are separately owned, they actually work as a national system, and criticises earlier central organisations on the grounds that the looseness of the ties between the members has hindered collective action. Mr. Eastman sees propitious omens for the future in the fact that the executives have recognised these weaknesses and bestirred themselves to repair them. He adds his understanding that the new body will recognise the safeguards set up "through law for the protection of those who use the railroads and of the general public interest." Such a remark suggests that there is still some hesitancy on Mr. Eastman's part to accept the fact that railways may have the service of the community at heart although under individual management.

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Naming the Locomotive

Titles drawn from literature and mythology predominate among the older locomotive nameplates of those which, as we recorded last week, the L.M.S.R. is offering for sale at Crewe. This is doubtless either because erudition was more profound in the last century or because there were then less patented articles with which such names might be confused. The authorities had no fear that *Odin* would suggest a toothpaste, or the author of "Paradise Lost" be associated with a type of disinfectant. The dignified and the picturesque have continued to be regarded as suitable attributes for an engine name, and the search for current phenomena epitomising these qualities has led not infrequently to the ranks of railway directors. As may be observed from a study of locomotive splashers, this is a class of men endowed by fortune with names scarcely less sonorous than those of the gods and heroes of antiquity. Stephenson's first engine, indeed, was originally called *My Lord* in honour of Lord Ravensworth, who provided the money to build it. The title was later changed to *Blücher*, a second example of the ancient tradition behind personalities as a source of locomotive nomenclature.

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The Week's Traffics

Comparing the position of the receipts of the four group railways for the past week with those for the corresponding week of last year it will be seen that the latest returns go against a period when good increases were being shown in merchandise traffics, as well as in passenger traffics, except on the London Midland & Scottish. Coal class traffics a year ago were down. For the 41 weeks of 1934 the four companies together record receipts of £118,074,000, an increase of £4,903,000, or 4·33 per cent. Passenger train traffics amount to £53,722,000, showing a net increase of £723,000. Merchandise receipts are £40,699,500, an improvement of £2,825,000, and in the coal class traffic of £23,652,500 there is an improvement of £1,355,000. London Transport traffics for the past week mark an advance of £13,900, and for the 15 weeks of the year to date the improvement is £93,700.

	41st Week				Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	
	£	£	£	£	£	%
L.M.S.R. ..	+ 11,000	+16,000	+ 6,000	+ 33,000	+2,012,000	+ 4·44
L.N.E.R. ..	+ 8,000	+24,000	—	+ 32,000	+1,960,000	+ 5·97
G.W.R. ..	+ 4,000	+14,000	—	+ 18,000	+ 568,000	+ 2·95
S.R.	+ 7,000	− 500	+ 500	+ 7,000	+ 363,000	+ 2·30

The Belfast & County Down has an increase for the week of £93. On the Great Northern Railway (Ireland) the return for the week shows a gain of £850, contributed mainly by passengers. To date this company has an increase of £170,300, whereas at this time a year ago there was an aggregate decrease of £341,400.

* * * *

Accidents to Railway Servants

The Stationery Office publication containing the reports of the Ministry of Transport Inspecting Officers on the train accidents inquired into during the first three months of the present year also contains those of the Assistant Inspecting Officers on the more serious accidents to railway servants that were investigated. There were 42 such inquiries, of which 17 related to fatal cases. The 42 inquiries were distributed among the various companies

as follows (the number of fatal accidents is added in brackets): G.W.R. 2 (1); G.W. & L.M.S. Jt. 2; L.N.E.R. 16 (6); L.M.S.R. 14 (6); L.P.T.B. 2 (1); S.R. 6 (3). The men killed were drawn from the following grades: permanent way men 3; shunters 2, and one each from the ranks of porter, plumber's labourer, signal lineman, dock labourer, loader, surveyor's chainman, signal inspector, look-out man, goods yard foreman, fogman. In 7 of the fatal cases it was considered that the unfortunate men lost their lives as a result of their own want of care, and in another 7 instances the accident was considered to be due to misadventure. Want of judgment was named as causing one fatality and a failure of a steel boiler tube as leading to the death of the driver mentioned above. The surveyor's chainman is considered to have lost his life because no look-out man was provided for work that was being done within 50 yards of a busy tunnel outside one of the London termini.

* * * *

Overseas Railway Traffics

The Argentine exchange has shown some improvement during the past fortnight, being 7·08 pesos to the £ for the past week as against an average of 7·09 pesos for the week before that and 17·13 pesos two weeks earlier. This has been of some benefit to the traffics of the Buenos Ayres & Pacific and the Central Argentine, which have decreases of £11,086 and £6,534 respectively for the past week, compared with £17,827 and £14,945 respectively a fortnight ago. A note to the latest Central Argentine traffic return shows that the Eucharistic Congress has had an effect on receipts. On the Entre Rios the takings in sterling have shown small increases for the past two weeks. The Canadian Pacific has been unfortunate in recording two successive decreases amounting together to £71,400. Antofagasta Railway receipts for the past week showed an increase in sterling of £5,020, and for the 41 weeks of the year to date the advance is £146,140 over the figures for the same period of 1933.

Railway.	No. of Week.	Weekly Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
		£	£	£	£
Buenos Ayres & Pacific ..	.. 15th	69,145	– 11,086	1,042,972	– 198,864
Buenos Ayres Great Southern	.. 15th	113,173	– 35,921	1,825,752	– 464,446
Buenos Ayres Western ..	.. 15th	38,056	– 13,839	615,476	– 163,800
Central Argentine ..	.. 15th	122,679	– 6,534	1,862,961	– 156,910
Canadian Pacific	.. 40th	521,000	– 36,800	18,701,000	+1,746,600
Bombay, Baroda & Central India	27th	140,625	+ 3,075	3,991,650	+ 184,425

* * * *

Netherlands Railways in 1933

A further decline of 12·2 per cent. in the revenue of the Netherlands Railways was recorded in 1933, and was only partially offset by a reduction of 6·6 per cent. in the expenditure. Since 1930 the receipts have fallen by 30 per cent. As in 1931 and 1932, the State had to make a grant to provide the 4 per cent. dividend guaranteed under the 1920 Convention, but whereas the grant in 1931 was only 2,592,777 fl., it rose to 17,314,915 fl. in 1932, and to no fewer than 28,690,971 fl. in 1933. The revenue amounted to 122,437,754 fl. and the working expenditure to 109,461,502 fl., giving an operating ratio of 89·4 compared with 84 in 1932. Of the total revenue, 61,776,908 fl. came from passenger business and 54,941,088 fl. from goods traffic, these figures being respective decreases of 11·5 and 12·6 per cent. The salaries and wages bill amounted to 81,774,000 fl., or 74 per cent. of the total expenditure. This sum was a reduction of 7,789,000 fl. compared with the preceding year, but the staff had been reduced from 37,900 to 36,465. Although passenger and goods revenues declined, the number of passengers carried rose by 1 per cent. to 50,113,298, and the goods traffic fell only by 188,033 tonnes to 18,102,641 tonnes, the discrepancies between the proportionate alterations in revenue and traffic being due to lower rates and shorter hauls. The length of line open to traffic rose from 3,639 to 3,657 km., but the passenger and goods train mileages remained almost unchanged at 40,336,856 km. and 13,565,444 km. respectively. At the end of the year the rolling stock list comprised 2,438 steam locomotives, 153 electric motor coaches, and 34 railcars with internal combustion engines.

* * * *

Nigerian Fare Reduction Doubles Travel

In the absence of Mr. G. V. O. Bulkeley, General Manager, on leave, the letter to the staff in the Nigerian Railway *Bulletin* for June is written by Mr. H. D. Gibson, Superintendent of the Line. After exhorting all grades to tell their customers what the railway can do to help trade and to attract new custom, he points out that all traffic staff should aim at becoming sales experts. Economy in small matters, he also points out, will eventually total up to a considerable item in the revenue account. Turning to details, Mr. Gibson says: "Last year we reduced our third class fares to ¼d. per mile. We carried 5,179,206 passengers, an increase of 2,801,268 on the previous year's total. We earned £20,146 more money by doing so. This illustrates what can be done, and is a complete record." That fare reduction should secure an increase of 118 per cent. in the number of passengers carried, in a year such as 1933, is certainly remarkable, and clearly demonstrates how effective a means this is of popularising travel. Moreover, though fares in India, and probably other countries, are about as cheap, this Nigerian figure of ¼d. once more bears witness of how low a fare can be charged and be justified financially. Incidentally, this comparatively new railway bulletin would certainly seem to be an excellent medium for spurring on the Nigerian Railway staff to even better achievement, and for expressing the thanks of the administration to station and train staff for their efforts, as is done in the last paragraph of Mr. Gibson's letter.

* * * *

Glasgow-Edinburgh Expresses

During the past year or so a steady improvement has been effected in the times of the L.N.E.R. express train service between Edinburgh and Glasgow. So far as concerns Scotland, the route is not merely unique in cutting across the heart of that mountainous country practically on the level, but also in the combination of this flatness with the 1 in 42 gradient by which access is obtained to the Glasgow terminus at Queen Street. Help in climbing this incline has always been required by most outgoing trains, and since the rope haulage method was scrapped a banking engine behind has been provided. The caution necessary in descending through the tunnels to the Glasgow terminus equally hampers the westbound run. In these circumstances the 55 min. now booked over the 47¼ miles by three non-stop trains requires some smart locomotive work, and still more so 58 and 59 min. when an intermediate stop is included, as in ten other cases, especially as the trains frequently exceed 300 tons in weight. Twenty-four trains on the service now have an average running time of 61 min. apiece; and all that remains, as we have commented previously, is to reduce the sequence to even hourly intervals—which from the timetable would appear to be possible without great difficulty—so that without a timetable the passenger in either city would know that at each hour he could travel to the other with a journey of an hour's duration, or slightly less. This seems a peculiarly suitable route for a systematic train service, which could be introduced without leaving any

of those breaks of sequence which have sometimes impaired the value of such schemes elsewhere.

* * * *

Steamers on the Lake of Constance

As Germany, Switzerland, and Austria all have frontiers on the shores of the Lake of Constance, or the Bodensee as it is called in the German, it may be best described as a "buffer" lake. From a political view its presence may no doubt be more satisfactory than that of a "buffer" state; considered from the communications view point, however, it causes a number of undesirable severances in international land routes. Along the length of the lake traffic is not seriously hindered, as the necessary detour of the railways round the shores is in few cases other than trivial. Traffic passing between the north and south shores, however, is faced with a different proposition, if a land route is to be followed, by reason of the greatly increased rail mileage and also the double crossing of the Austrian frontier at the eastern extremity of the lake. It is between north and south shore ports, therefore, that the steamship and ferry services—chiefly railway owned—described on page 632 of this issue, have been developed principally. At the present time it seems that there is a considerable contraction taking place in the demand for these steamer services. This is to be regretted as yet another significant indication of the European scene, and also of the lamentable general decline in international trade.

* * * *

Some C.T.C. Figures

When Major Peter read, on March 14 last, his paper on "Centralised Traffic Control" at the Institution of Railway Signal Engineers—summarised on page 504 of our issue of March 23—he said that there was an idea that C.T.C. was primarily suitable for single lines and for areas with infrequent traffic. That, however was quite an incorrect conception. That the Major was correct as to the prevalence of this wrong opinion was evident from the line taken by some of the speakers in the discussion that followed the reading of the paper. Reference to the editorial comments that accompanied, on page 372, our description, on March 19, 1933, of the Stanmore branch, and the use there of C.T.C., will show that we have had no such restricted vision, as, after saying that it could control an "area wherein there may be dozens of stations, sidings and connections," we proceeded to remark that "it is, further, equally applicable to single lines as to double and can be arranged for reversible working over two or more lines." Now, from information supplied by the London Passenger Transport Board, it appears that the number of trains on the Stanmore branch is 99 round trips on each weekday, 105 on Saturdays and 51 on Sundays, or 651 round trips a week. Each of these, we would add, requires the movement of at least one crossover-road at Stanmore and the actuation of two or more signals, and all that is done by means of the C.T.C. control panel in Wembley Park signal-box, 4½ miles away.

* * * *

Permanent Way Maintenance Economies in U.S.A.

At the first convention held for four years of the Roadmasters' and Maintenance of Way Association of the U.S.A., Mr. Harry G. Taylor, Chairman of the Western Association of Railway Executives, in an address of welcome to the delegates at Chicago in September, remarked on the extraordinary economies effected since 1929. In that year the railroads of the United States expended a total of more than $855,000,000 for maintenance of roadway and structures. In 1933 that figure had dropped to $322,000,000, or a little over one-third of the expenditure for 1929. In 1929, 411,000 men were employed in the maintenance of roadway and structures, in 1933 only 198,000. No doubt deferred maintenance, which will have to be overtaken, was to some extent responsible for this achievement, but the fact remains that, in spite of it, train speeds generally have been increased during the same period, which points to the probability that most of the saving came from mechanisation and improved methods. Mr. Taylor said if they had hitherto been building tracks for a maximum speed of 60 m.p.h. they would now have to build them for a maximum speed of at least 100 m.p.h. Even so, it is unlikely that the expenditure of 1929 will ever again be necessary.

* * * *

New Range of Sentinel Locomotives

We are firm believers in the geared steam locomotive when this is constructed to permit the use of the all-enclosed high speed engine equipped with roller bearings and having vital working parts running in a spray of oil. The newest Sentinel units make use of just such an engine and are a departure from conventional railway practice which should attract the notice of engineers throughout the world. The design permits a variation in wheel diameter and gear ratio and so wide is the range which can be accommodated that the same engine built with differences here can be used either for express services at over 80 m.p.h. or for moving trains of over 1,000 tons at 11 m.p.h. It would appear from the booklet recently issued by the Sentinel Waggon Works Limited and reviewed elsewhere in this issue, that all but the most spectacular work of the largest main line locomotives might be done by a Sentinel. Coal is the fuel normally used, but units are available for oil burning. The parts used in the smaller units are interchangeable with the parts used on the larger, and while there is not quite the facility for varying the size of the machine that is offered by a set of Meccano parts, the design does allow a single set of spares to serve for locomotives of different sizes and types.

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The Status of the Steam Locomotive

When anyone of long experience and occupying the position of chief mechanical engineer to a leading railway company stands up at a meeting attended by numerous locomotive men and other railway officers and expresses confidence in the ability of the steam locomotive to maintain its position as the chief power unit operating on our railways, it may be taken as reasonably certain that, in the absence of some epoch making development of which we at present have no knowledge, the process of generating steam in locomotive boilers for the purpose of railway transport will continue for an indefinite period. Mr. Gresley voiced that belief in his presidential address recently delivered at a meeting of the Institution of Locomotive Engineers with, however, one important qualification, viz., that the locomotive shall be of greatly improved efficiency as the result of the establishment of a locomotive experimental station. This apart, there can be no doubt as to the general attitude of mind among railway mechanical engineers and others concerned as to the general status of the steam locomotive in its present stage of development. Confidence in it is not based on failure to appreciate the claims of alternative forms of traction, but because it provides a relatively economical, reliable and effective means of hauling trains at good average speeds day in and day out under widely divergent conditions calling for an elasticity of service which steam as a motive force is adequately suited to fulfil.

Tanganyika Railways

THE Tanganyika Railways consisted at December 31, 1933, of 1,354¼ miles of metre gauge line divided into two principal sections without physical connection with each other. On the Central Railway the main line of 775 miles runs from the port of Dar-es-Salaam on the Indian Ocean through Manyoni and Tabora to Kigoma on Lake Tanganyika, and a branch of 235½ miles leads from Tabora northwards to Mwanza on Lake Victoria. There was also open the Manyoni-Singida section (71½ miles) of the Manyoni-Kinyangiri branch northwards from the Central Railway. The remaining section of 22 miles from Singida to Kinyangiri has been completed during 1934. The Northern (or Tanga) Railway of 272¼ miles proceeds from the port of Tanga, on the Indian Ocean, to Moshi and Arusha, and makes a connection with the Kenya and Uganda Railways by the Kahe-Voi link. Steamer services on Lake Tanganyika, wharves at Dar-es-Salaam, Tanga, Kigoma, Mwanza, and 500 miles of coast line are under the same administration as the railways.

The report received this week from the General Manager, Colonel G. A. P. Maxwell, C.M.G., covers the full twelve months of 1933, and exact comparisons cannot be made with the previous period reviewed which included only the nine months April-December, 1932, in consequence of the closing date of the railway financial year having been altered from March 31 to December 31 to accord with the accounts of the Territory. The large decrease in long haul traffic to and from the Belgian Congo was again severely felt. Some 55,000 tons of this traffic has been lost, a great portion of which was copper. Local tonnage has also fallen by some 65,000 tons, though the programme of increased native production has continued. Colonel Maxwell remarks that it is difficult to see how the territory can produce enough agricultural produce to make the railway pay. The largest revenue-producing item on the Central Railway in 1933 was cotton piece goods, which brought in £78,969, and the increase over previous years in this commodity was mainly in Japanese goods. Except where otherwise stated, the figures in the accompanying table refer to railway operations only:—

	Year 1933	Nine months, 1932
Passengers	245,435	201,985
Tons, revenue earning	198,353	147,897
Ton-miles, revenue earning	41,972,129	31,159,982
Train-miles, revenue earning	617,903	498,592
Average receipt per ton	35s.	35s.
Operating ratio, all services	66·40 per cent.	73·48 per cent.
	£	£
Coaching revenue	80,335	64,283
Goods revenue	349,158	258,510
Gross receipts	473,907	379,228
Expenses	319,639	277,668
Net earnings	154,268	101,560
Other services (net)	24,496	10,178
Interest charges, all services	291,399	161,816
Net loss	112,635	50,078

On the subject of road competition the General Manager reiterates the remarks contained in his previous report as to the necessity for more regulation of goods carryings by road motor vehicles. He adds that it is now proposed to introduce legislation entirely preventing carriage of goods for profit between points which compete with the railways. Mr. Roger Gibb's report on railway rates and finance was received early in the year, and alterations have been made in the rate for grain, &c., as the result of his recommendation. Another suggestion regarding the abolition of country produce rates for goods traffic was anticipated and most of such rates were abolished towards the close of the preceding year. A considerable number of other amendments to rates as recommended in the report came into force on January 1, 1934. A service was begun in April, 1933, by the two Sentinel cars stationed on the Northern Railway. A daily service, and on Mondays two trips each way, is maintained. A total mileage of 37,074 miles was run by the two cars during the period. The utmost use was made of Garratt engines with their haulage capacity of 450 tons between Dar-es-Salaam and Morogoro. Stations not now provided with staff number 41 out of a total of 111, *i.e.*, 37 per cent. of the stations on the line are treated as closed stations. Traffic is, however, accepted at these closed stations, the booking, &c., being carried out by the guards of the trains.

Experiments have been begun on a very limited scale with building up worn points and crossings by the arc welding process. A district engineer spent part of the year on a minute inspection of the girders of the Central Railway bridges. It is hoped that his report will enable the Crown Agents for the Colonies, who are engaged on a theoretical study of the existing girders, to give definite advice regarding the replacement of the strengthening of all structures requiring improvement. Attention is again directed to the large debt charges on capital which the railways have to bear. The railway and allied services can meet the ordinary working expenses, and it is the large debt charges which cause the deficit. The rate of interest is very high for present day reckoning.

* * * *

Japanese Government Railways

PROBABLY unique in a world of depression, the Japanese Government Railways during the year ending March 31 last showed appreciable increases in revenue and traffic of all kinds, and the year was a record since 1929. The improvement, of course, was due to the remarkable boom in industry, more especially on the export side. But even in comparatively lean years the Japanese Government Railways have always shown a surplus after all charges had been met, and this must be set down, partially at least, to the fact that political interference is a minimum. The operating results are compared in the following table, the yen being now approximately 16·8 to the £:—

	1933–34	1932–33
Passenger numbers (millions)	841·31	781·15
Tonnes of goods (thousands)	71,970	61,733
Passenger train km. (millions)	147·9	139·2
Goods train km. (millions)	57·0	52·0
	Yen	Yen
Capital invested	3,682,426,398	3,563,422,511
Passenger receipts	222,247,143	203,542,267
Total coaching receipts	254,533,956	233,387,259
Goods receipts	195,183,483	172,156,623
Total operating receipts	473,570,962	425,954,073
Working expenditure	282,199,614	265,081,895

During the year under consideration, the working revenue increased by 11 per cent. to 473,570,962 yen, and the working expenses by 6·5 per cent. to 282,199,614, giving an operating ratio of 59·6 in place of 62·2. The total income was credited with a sum of 683,054 yen balance on the suspense account, bringing the final revenue figure up to 474,254,016 yen. The profit on operating amounted to 191,371,348 yen (or 19 per cent. more than in 1932-33), and as the interest and subsidiary charges totalled 103,379,145 yen, there was a net balance of 88,675,275 yen, representing 2·4 per cent. on the capital invested, against 1·71 per cent. in the preceding year. The number of passengers carried increased by 8 per cent., the passenger earnings by 9 per cent., and the combined

passenger and coaching receipts by the same amount. Goods tonnage rose by no less than 16·5 per cent. and goods revenue by 13·5 per cent., the smaller increase in receipts being due to the shorter average haul, 166·6 km. against 171·1 km.

The length of line open to traffic increased by 470 km. to 15,737 route km., and the total length of all track is now 25,612 km. A decrease of 40 was made in the steam locomotive stock, the present total being 3,913, but the number of electric locomotives was increased by 10 to 141; The total number of locomotives on March 31 was 4,064, the special units remaining at 10 as before. The number of electric motor cars increased by 106 to 1,375. The carriage stock was increased by 99 units to 9,254, of which no fewer than 8,758 were bogie vehicles; goods vehicles totalled 65,804. The personnel increased from 198,848 to 201,538, and the wages bill by 1 per cent. to 137,932,168 yen, or 49 per cent. of the working expenditure. From the ancillary business of shipping between the various islands a profit of 5,984,835 yen was made, this being an increase of 17 per cent. compared with the fiscal year 1932-33. The working expenditure was made up as follows: general expenses, 2·1 per cent.; maintenance of way, 15·5 per cent.; electric maintenance, 3·7 per cent.; maintenance of rolling stock, 9·7 per cent.; transportation, 25·1 per cent.; traffic 36·0 per cent.; road services, 0·3 per cent.; shipping, 2·0 per cent.; subsidies and relief associations, 1·7 per cent.; health and welfare, 2·1 per cent.; miscellaneous, 1·8 per cent.

* * * *

The Distant Signal Problem

THE practice of the Institution of Railway Signal Engineers of occasionally having a discussion on subjects not preceded by a paper has its advantages. One benefit is that those who are interested in the question under consideration must speak upon it without being prompted by the paper. Another benefit is that there is less formality, for there are those who would be willing to open a discussion, but would hesitate to undertake the task of writing a paper. We would add that the Institution of Railway Signal Engineers adopted this practice during the war and partly for this reason was able to continue its meetings during those busy times. It was a meeting of this sort that occupied the attention of the institution on Wednesday, October 10, when Mr. T. S. Lascelles rendered a great service to all interested in signalling by opening a discussion on the distant signal problem. In his review of the early history of that signal he pointed out that originally it was designed to protect trains standing or shunting in stations. The first distants of the semaphore type were fixed on the whole length of the Great Northern Railway when it was opened between London and Peterborough in 1852. They were placed at some distance from the signalling point, which was almost always at a station. Mr. Lascelles quoted some interesting evidence given to the Royal Commission on Railway Accidents of 1874. For instance, General Hutchinson, dealing with the opinion that the purpose of a distant signal was to act as a warning of the condition of the home signal, said its original purpose was to protect anything standing beyond it. Again, some 600 drivers on the North Eastern Railway petitioned that the distant should be so interlocked with the home signal as to ensure that the latter must be at " clear " or the distant could not be " off." About that time, some companies, among them the Great Western, required that the auxiliary—another name for distant—must always show the same as the main signal. Before leaving that phase of the subject Mr. Lascelles remarked that the introduction of higher speed trains, driven by engines of the diesel type, had led to distant signals, in Germany and elsewhere, having to be carried farther from the stop signals they apply to.

Having considered, with a brevity which was necessary, but was to be regretted, the history of the distant signal, the speaker entered upon the main purpose of the discussion—its use. At once he mentioned the anomaly of the short-section, wherein an obstruction at, say, E, will cause the distant signals at D, C, B and A to be kept " on " in order to protect a train that not only is two or three miles away, but has four sets of stop signals in its rear to safeguard it. What aggravates this condition is that, should even only A and E be stations, the second train cannot have a free run into A until the first train has left E, been cleared out of the section in advance of E, and the starting signal E lowered for the second train. Matters, in this respect, are much worse in foggy weather, which causes the delays in suburban traffic that are so irritating. It is true, as Colonel Woodhouse pointed out in his report on the Doncaster collision of March 28 last, which was summarised in THE RAILWAY GAZETTE of August 24, that this method of working carries out the principles of General Rule 39 (a) and also, to quote the report, " has the effect that Potteric Carr distant is not lowered until the succeeding stop signals, as far as Red Bank starting signal inclusive, are ' off '; similarly, Balby Junction distant signal, when lowered, indicates that the succeeding stop signals are ' off ' as far as Doncaster South, the next box north of South Yorkshire Junction." But we would point out that before Potteric Carr distant signal could be put to " clear " the previous train must be 440 yards past the home signal next in advance of Red Bank starting signal, or a distance of 3,450 yards (practically two miles). The rule 39 (a) mentioned by Colonel Woodhouse was next discussed by Mr. Lascelles. That rule, when it was numbered 40 (a) in the former General Rule Book, applied to the working of a home signal when its starting signal is " on." The wording is different in the new book, in order to cover outer and inner home signals, but its effect is the same. Only indirectly does this rule enter into the distant signal problem; it does so because a distant cannot be put to " clear " until the stop signals that govern it are " off," which is a contributory cause of the troubles created by the usual method of operating short-sections. Then, although it is only a subsidiary factor in the distant signal problem, there is the fact—as illustrated in the Ais Gill accident of 1913, in the Crich Junction accident last year, and on other occasions—that the premature lowering of the home signal may convey to the driver the impression that the starting signal also is " off."

When dealing with the question of splitting distant signals for junctions, Mr. Lascelles said that the eternal question of route *versus* speed signalling could not be avoided. His point, though, was whether the very common practice of not providing a separate distant signal for leading from a main line on to a branch was satisfactory. Herein, we would observe, a definite step was taken when the Ministry of Transport issued the revised requirements for new railways in February, 1925. For the first time, instructions were then given on that point, and these were repeated in the July, 1928, edition, wherein we read, at line 41, page 6:—

> At diverging junctions, one distant signal only should be provided, worked for the junction line over which the highest speed is permissible, unless in exceptional circumstances more are essential.

This was a decided change from the practice adopted, some forty years ago, when the question was debated by all the railway companies' signal engineers in the conferences of the Association of Railway Companies' Signal Superintendents and Signal Engineers. What was then decided is

expressed as follows in "Railway Signalling" (May, 1900), wherein it was laid down:—

> Each home signal at a junction should have its own distant signal, except where it leads to a bay line, a short goods line or through a crossing from fast to slow lines, or *vice versa*. In such cases the distant signal should be released by the home signal for the main line only and be locked at "danger" when the subsidiary signal is "off."

Mr. Lascelles, however, reminded his hearers that apparently the London & North Eastern Railway was now providing real splitting distant signal indications in its colour light signal installations at some places, and that Mr. A. F. Bound's colour light signalling scheme on the London Midland & Scottish Railway system also does so.

LETTERS TO THE EDITOR

(*The Editor is not responsible for the opinions of correspondents*)

Arrival Punctuality

London, October 10

To the Editor of The Railway Gazette

Sir,—About a year ago you were good enough to publish some particulars I sent you of the arrivals, at London termini, of the main line trains by which I had made a journey of 50 miles or more during the previous 18 months, and it may perhaps interest your readers to see a further year's figures—to the end of September, 1934. Saturday journeys during June, July, August, and September are again excluded (although, in view of the timetable alterations undertaken this summer to improve the Saturday results, I am by no means sure that their exclusion is justified) as are also all arrivals during the prolonged foggy periods of last winter. The average late arrival is, I regret to say, 7·2 min. a train (as against 5·6 min. in my previous letter on the subject), 147 arrivals having totalled 1,062 minutes late. Punctual, or early, arrivals numbered 38, and 85 trains were under 5 minutes behind time.

I have also kept note, during the same period, of "provincial" arrivals. The same conditions apply as to exclusion of summer Saturday travel, journeys of under 50 miles, and periods of prolonged fog, but here, of course, although many arrivals are at termini or at stations which, from the passengers' standpoint, may be classed almost as termini—Norwich, Leeds, Birmingham, Bristol, &c.—the trains may, in other instances, have subsequently lost or regained time before reaching their journey's end. But the result is, by comparison with London, good—192 arrivals totalling 715 min. late, 3·7 min. a train, with 67 arrivals punctual or early and 137 under 5 minutes late.

VIATOR

National Dividend or Subsidy

28, Woburn Square, London, W.C.1.
October 17

To the Editor of The Railway Gazette

Sir,—The letter and editorial comments appearing in your issue of October 12 on the subject of subsidies to the consumer as such, raise a vital point of procedure, which does not seem to me to be covered by your correspondent, Mr. Jacklin, nor by your own references to the subject.

Subsidies have always been debited to the taxpayer, and, therefore, despite the temporary assistance afforded to a particular activity in the nation's economy, have been at the expense of the rest of the community, whose advantage has been problematical owing to the debt incurred, and to the well-proved experience that prices rise to absorb additional money whilst it is in circulation.

If now it is proposed to issue what one may call a citizen's income, somewhat as a universal pension, by the creation of new money, *not repayable* to the issuing office, surely a mechanism is required to ensure that prices are not put up, in such a way as to defeat the object of the monetary issue—avowedly, the greater consumption of goods already produced; and technically, I presume, to discharge the producers' costs and so be duly cancelled when it has served its purpose.

I would not oppose the proposal, so far as I understand it, for I consider the economic situation too serious and novel to permit of mere rejection, especially of a solution of our dilemma by the easiest possible means, that of adapting the money system to the realities of production.

But a new money convention is surely required, by which the income issuing offices (presumably the banks empowered by the treasury) would enter up, on some reliable statistical basis, the value of the production they are, in effect, distributing, to balance the issue of money made through the public for that purpose.

This cannot be dismissed as a merely technical point, for it involves a principle quite outside the conventions of the money system as we have it. I can quite see that the State is not obliged, as a bank must be, to meet a money issue with a money return—for money is not a commodity to the State as it is to a bank—but it is, I suggest, essential that a correct book-keeping method should be instituted for record purposes, and the value of the new production balanced against the successive issues of new money.

Properly safeguarded, the injection of more purchasing power is obviously our greatest need at the present time. But more money is not more purchasing power unless it actually serves to distribute more goods and claim more services.

Yours, &c.,

W. T. SYMONS

[While we agree that the points raised by our correspondent are vitally important, and we are therefore glad to give them publicity, we feel that the technique of *how* more purchasing power, as defined in his last sentence, is to be "injected" into the pockets of consumers is a matter outside our scope. What we would emphasise is that more purchasing power certainly is needed, both to enable the consumer to buy goods and services and the producer to get rid of them.—Ed. *R.G.*]

The First Sleeping Car

London, W.C., October 17

To the Editor of The Railway Gazette

Sir,—The recent letters from Messrs. Reginald B. Fellows and G. A. Sekon leave little reasonable doubt that the bed carriage of the Grand Junction Railway was available from the opening on July 4, 1837. The question arises, however, as to whether in those early days it was used for *sleeping* or only resting. The first timetables of this railway, in medallion form, show the latest departures from Birmingham at 7 p.m. and from Liverpool and Manchester at 6.30 p.m. With a total journey time advertised as 4½ hours, sleeping accommodation appears unnecessary.

Furthermore, the bridging of opposite seats by a padded board, with provision for the occupant's feet to project through a panel into the "boot," seems scarcely comparable with the provision of a separate sleeping car. The cautious statement in your leader of August 24 giving, on the strength of existing evidence, pioneer honours to the Cumberland Valley Railroad sleeping car of November, 1837, still appears to accord with known records.

SCHLAFWAGEN

PUBLICATIONS RECEIVED

The Permanent Way Institution Journal and Report of Proceedings. August, 1934. Vol. 52, part 2.—This issue of the *Permanent Way Institution Journal* gives an account of the proceedings at the Jubilee Convention held in London from July 7 to July 12, and includes the Jubilee lecture on "The Railway Highway," delivered by Mr. A. Newlands, C.B.E., M.Inst.C.E., at the summer general meeting, as reported in THE RAILWAY GAZETTE of July 13. There are also papers on the reclamation and refettling depot at Darlington, L.N.E.R., and on rail joints and broken fishplates.

The Story of the Irish Mail. London Midland & Scottish Railway, Euston Station, London, N.W.1. 8 in. × 5 in. 20 pp. 10 half-tone illus.—It is not without interest that the publication of this booklet should coincide with the centenary of the death of Thomas Telford, the engineer of the Holyhead road. In 1836 the coach journey from London to Holyhead took 27 hours, and the sailing packets added some 17 to 20 hours' further discomfort in making the crossing to Ireland. To-day the Irish Mail, travelling over the iron road from Euston to Holyhead, and the luxurious steamers of the L.M.S.R., have between them reduced the journey to 8¾ hours from Dun Laoghaire (Kingstown) to London; and this little history traces the development of the service through the intervening century. It is intended for distribution to passengers on the Irish Mail and on the steamers, and so includes detailed schedules of the present-day journey in both directions, together with notes concerning the places passed *en route*. Some well-reproduced illustrations of the rolling-stock, locomotives, and steamers used on the service add to the attractiveness of the publication, which is the second of a series intended to deal similarly with the principal L.M.S.R. express trains.

Quota News.—We have received from Mr. Ashton Davies a copy of the latest issue of *Quota News*, the L.M.S. journal specially designed to encourage staff effort and morale, which appears after a lapse of two months, for the editorial confesses that the entire staff went on holiday in August, taking advantage of the opportunity so afforded to establish personal contact with its contributors. The result is an even more inspiring record than before of staff enterprise and resource, ranging from the case of a signalman who runs a one-man L.M.S. enquiry and advertising agency at his own home to the diplomacy of a Sheffield official in appeasing a party of 300 thirsty Yorkshiremen who had been unable to bring their beer with them because their train was of non-corridor stock. Results of the inter-district quota competition for June and July are tabulated. Sheffield heads the passenger table for the latter month, with 105 per cent. of the prescribed value of business. Four other centres secured 100 per cent. or over. They were Stoke (100), Birmingham and Manchester (101), and Chester (103). Garston has jumped from 99 per cent. of the goods quota in June to a leading position with 150 per cent. in July. Welcome deductions can be made from the fact that there were ten other districts between that and the one hundred per cent. mark. Fleetwood was runner-up with 125 per cent., followed by S.W. and Central Wales (115), Goole (111), Sheffield and Stoke (107), Wolverhampton (106), Chester (102), and Bolton, Northampton and Belfast (100).

Sentinel Patent General Service Locomotives.—This booklet has been issued to provide railway engineers with all the information they would ordinarily require when contemplating the purchase of a light economical steam locomotive. The Sentinel Wagon Works Limited offers a new range of two, three, and four-engine units developing 300, 450, and 600 driving-wheel horse-power with a crankshaft speed of 700 to 900 r.p.m. The lower speed corresponds to the use of simple-expansion engines which are especially suitable for heavy starting efforts and rapid acceleration, while the higher speed corresponds to the use of compound engines, which use about 25 per cent. less water and fuel under ordinary running conditions. The booklet contains a range of curves for each type of engine, showing the steam consumption for different points of cut-off plotted against engine r.p.m. The compound engine uses from 11·7 to 15 lb. per b.h.p.-hour, while the simple engine uses from 15 to 20 lb. These very low figures are achieved by using steam at the relatively high pressure of 300 lb. per sq. in. in the simple engine and at the still higher pressure of 500 lb. per sq. in. in the compound engine. The fact that the engines are geared to the axles (every one of which is driven by its own engine) and run up to a maximum speed as high as 1,500 r.p.m. must also have an important bearing on this question of economy. Both types of engine have two cylinders giving a stroke of 6 in. In the simple engine each cylinder is of 6-in. bore; in the compound engine the bores are 4¼ in. and 7¼ in. The engines weigh under 1,000 lb. each, and they are supported partly on the axles which they drive and partly from the framing. The point of support from the framing is near to the centre of gravity of the engine, so that the deadweight borne by the axle is only a small fraction of the total engine weight. The whole weight of the locomotive is available for adhesion, for although the axles are uncoupled, they each have an engine to make them into drivers. The two- and three-axle locomotives have a rigid wheelbase, but the four-axle locomotive is carried on two bogies.

The engines are equipped with roller bearings wherever practicable, are totally enclosed, and are self-lubricating like automobile engines. The boiler, which has an evaporation of 4,500 lb. an hour in the smallest size and 12,500 lb. an hour in the largest, is of the three-drum water-tube Woolnough type. In these boilers the tubes are slightly curved to allow for expansion, but they can be sighted through without difficulty when the manhole and other covers are removed. Superheater elements are provided to give a steam temperature of 750° F. The axle-boxes in the new Sentinel locomotives are not carried between hornblocks in accordance with the usual railway practice, but are constrained by radius rods. Provisions are made for taking sideways shocks so that these are not transmitted to the engine casing. Different wheel diameters and different ratio driving gears can be had, depending on service requirements. Speeds of over 80 m.p.h. are obtainable with a suitable combination and relatively light trains, but trains exceeding 1,000 tons in weight can be handled if a combination giving a low maximum speed is used. The booklet contains a comprehensive set of tables and charts showing all the many possibilities. It also contains sectional and other drawings which are extremely clear and of great general interest. The booklet has been built up on the loose-leaf principle.

Air Compressors.—B.E.N. Patents Limited, Gorst Road, Park Royal, N.W.10, sends a catalogue showing the company's range of air compressing plant for 1935. The many applications of compressed air in all kinds of manufacturing processes and operations are summarised in a foreword, followed by an explanation of the various types and technicalities of the machinery, which will be of great assistance in selecting the appropriate equipment for individual requirements. The leading features of B.E.N. compressors are set out in a numbered key to a full-page sectional diagram. Single and twin cylinder compressors are supplied either singly or as units with receivers of suitable size. Electric motor drive is included in the majority of the units, several of which are of the portable type, mounted on easily manipulated trolleys. Spray painting equipment is obtainable in complete portable sets or for attachment to existing units. Applications of the equipment range from tyre inflation, for which a special combined pressure gauge and universal connector is supplied, to most of the heavier duties for which this modern development in workshop operation is suitable. In appearance and contents this B.E.N. catalogue forms an attractive introduction to the possibilities of compressed air plant. The range of complete equipment and accessories will appeal alike to all present and prospective users.

THE SCRAP HEAP

The tradition that a lady sitting in this carriage for ten minutes WITHOUT SPEAKING will become a bride within the year made it a popular feature of the Baltimore & Ohio display at the Century of Progress exhibition, Chicago. We reproduce the illustration by courtesy of the "Railway Age"

MISSING THE MARK IN THE DARK

"Have you ever been in a bad railway accident?"

"Yes, in a tunnel. I kissed my fiancee's father."—*From "The Evening News."*

* * *

In my railway career I have many times seen passengers, generally elderly ladies, go straight to the guard after arriving at a terminus and tip him for having brought them "safely" to their destination. I have often been tempted to ask these kindly disposed folk: "What about the driver?"—who is as responsible for the guard's safety as for the passengers'! But this quaint custom I suppose will only pass with the very last of the Victorians—*A. F. of Worthing in "The Daily Mail."*

* * *

WHAT U.S.A. RAILWAYS DO IN AN HOUR

The following details of what takes place on the Class I railways of the U.S.A. in the course of a single hour appeared recently in *Railroad Data*:—

In an hour, the railways earn $353,362 from their transportation operations.

In an hour, the railways spend $256,772 in operating expenses.

In an hour, the railways pay $160,261 in wages. (Much of this total is included in operating expenses.)

In an hour, the railways pay $28,493 in taxes to national, state and local governments.

In an hour, 3,306 cars are loaded with revenue freight on the railways' lines.

In an hour, 49,424 passengers board the railways' trains.

* * *

HAVE YOU EVER MET A "BOSHMAN"?

The railway porter, driver and guard are familiar names to everyone, but few people, outside Swindon works, G.W.R., have ever heard of a boshman. He is no alien, neither does he owe his name to his utterances. His job is removing accumulated grease and dust from parts of vehicles due for repairs by boiling them in a tank of acid known as the "bosh." Queer as it may seem, there is nothing sinister in the job performed by drag-out boys, holders-up, pull-up boys or roughers, for their jobs are dragging finished bars of iron from the rolling mill rolls to the benches to be straightened; holding up the heads of red-hot rivets to be beaten home by the riveter; pulling up the lever which opens the furnace doors to allow the white-hot bars to be removed for the roughers to place into the rolls. The saw doctor is an expert skilled in the task of keeping keen edges on tools, and the gland packer has no interest in Darwin's theories but in preventing the escape of steam or water from vulnerable parts of the engine. Similarly, a hooker-on is not a parasite of society. His work in life in fact is quite harmless, being that of clothing the engine boilers in heat-proof plaster, dipping wheels in tar, dressing rough castings with hammer, chisel and grindstone, and hooking-on articles to be lifted by overhead cranes.

* * *

SIX YEARS' TRAVEL WITH FORGED TICKETS

According to *The Times*, a man has been arrested by the railway authorities at Frankfurt, who, on his own confession, has been travelling for the last six years all over Germany, as well as to places in France and Switzerland, with false railway tickets. The arrested man, an artist, had forged genuine tickets in a most dexterous manner by altering the places of destination, the distance in kilometres, and the fares. Many forged tickets were found still in his possession, and these could be distinguished from regular tickets only with difficulty.

* * *

When a Liverpool express train stopped at Stafford the other day, the mewing of a cat attracted the attention of a porter, who found the animal sitting on a spring under one of the coaches. It is thought that it joined the train at Liverpool. Anyhow, it must have travelled from Crewe (20 miles) because that was the last stop before Stafford.

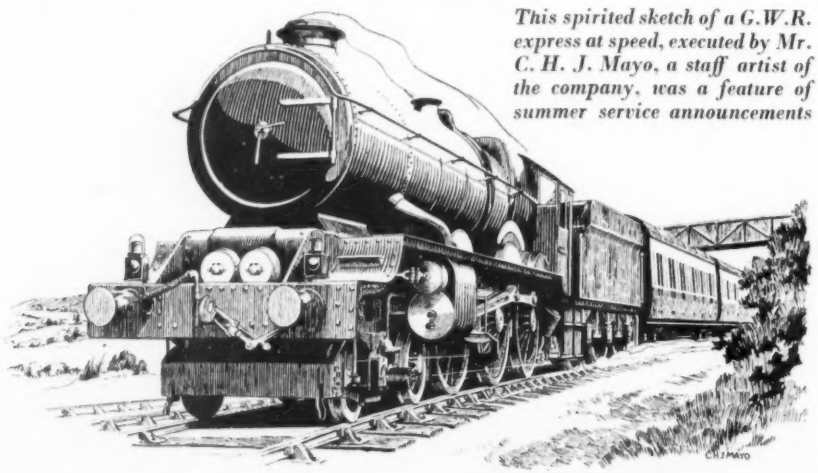
* * *

WRONG EITHER WAY

Grousing season ticket holder to fellow passenger: "They don't seem to care twopence about running this train punctually. It's *always* late."

Fellow passenger: "As a matter of fact it arrived slick on time three mornings last week."

Grouser (indignantly): "Yes, they *would* do that while I was away on holiday. Just as a matter of spite, I suppose."



This spirited sketch of a G.W.R. express at speed, executed by Mr. C. H. J. Mayo, a staff artist of the company, was a feature of summer service announcements

OVERSEAS RAILWAY AFFAIRS

(*From our special correspondents*)

South African workshops busy—Brazilian railways in difficulties—Chief Commissioner on Indian railway policy—Experiments with high-speed special train on long rail lengths in Germany—Danish continuous brake policy

SOUTH AFRICA

Financial Position

The audited figures indicating the financial position of the South African Railways & Harbours for the first three months' working ended June 30, 1934, are now available and they reveal as far as railway earnings from transportation services only are concerned, an increase of £839,882 compared with the corresponding period of the previous year. Railway working expenditure increased during the same period by £361,992. The result at the end of June of working the combined services, namely, railways, harbours, steamships and airways, was an accumulated deficit of £1,524,963. In arriving at this figure, contributions to betterment, pensions and superannuation funds totalling £209,250, and the deficit of £2,168,269 at March 31 last, have been taken into account.

Electrification

Work on the recently authorised electrification of the further section of the Natal main line from Cato Ridge to Durban has started, and by August 18, 1934, the steelwork of 51 towers for the transmission line had been fabricated and 26 towers had been erected. The electrification of the section from Glencoe Junction to Volksrust has also been authorised. With regard to the Daimana-Harrismith electrification scheme, 42 miles of overhead equipment have now been erected from Daimana.

Training Soldiers as Railway Chefs and Stewards

An unusual idea is being put into effect by the Union military authorities at Pretoria in transforming men of the Special Service Battalion into chefs and stewards. About a hundred of these young men will be trained in this manner every year. A South African Railway dining car will be stationed at Roberts Heights so that practical experience may be gained. The object of the scheme is to absorb as many men as possible into the railway catering service. Normally there are about 45 dining cars in commission (66 during rush periods) in the Union, in addition to the restaurants at all the important stations. The dining-room at the Houses of Parliament is also staffed by the railways. Though many chefs and stewards who have served at sea are still on the staff of the Catering Department, the policy of employing South Africans in these capacities has been followed for some years.

Pre-Cooling Facilities at Table Bay Docks

To meet the anticipated heavy increase in deciduous export fruit traffic, the immediate provision has been authorised of additional pre-cooling facilities in Nos. 1 and 2 cargo sheds at the East Pier, Table Bay Docks, at an anticipated cost of £25,000. These new facilities are to be available for the next deciduous season, commencing in December.

Rapid Production of New Wagon Stock

The railway departmental workshops are at present engaged on a very large order for the construction of 2,000 new four-wheeled steel drop-sided wagons to be used for the conveyance of general goods traffic, including bagged maize, coal and motor cars.

The principal dimensions of these wagons are as follow:—Length inside body and over headstocks 22 ft., width inside doors 8 ft., tare 21,720 lb., load 40,000 lb., capacity 490 cu. ft. Improved riding qualities under all conditions of loading are obtained by the provision of double action semi-elliptical springs which have a flexible main spring to prevent derailment of the wagon when empty, and a stiffer auxiliary spring which comes into action when the vehicle is loaded. Improved seating for the bearing spring is provided by increasing the width between solebars. Further alterations have been incorporated to facilitate assembly and repair work. The wagons are fitted with vacuum brakes, brake blocks being applied to both sides of each wheel. Hand brakes are also provided, and may be applied by levers from either side of the wagon.

The problem of providing rapid delivery of these wagons, without disorganising repair and other building work, was solved by arranging systematic methods of fabrication of certain parts at other depots and completing the final erection at Bloemfontein workshops. This is the first occasion on which so large a programme of centralised fabrication and manufacture of component parts has been undertaken in the departmental workshops. The magnitude of the work will be readily understood when it is stated that approximately 25,000 tons of material require to be fabricated and manufactured to build these vehicles. The first 500 of these wagons are expected to be placed in service by December, 1934, and up to the middle of August, 40 had been placed in traffic. The rate at which these wagons are being manufactured and delivered to traffic is 100 a month, or 1 every 2 hours in a working day of 8 hours.

LATVIA

State Railways in 1932-33

For the fiscal year 1932-33 the Latvian State Railways showed a working deficit of 1,120,000 lats compared with a deficit of 2,700,000 lats in the preceding year and a surplus of 2,600,000 lats in 1930-31. The revenue dropped by 17 per cent. to 23,760,000 lats, the passenger receipts falling by 16 per cent. and goods by 23 per cent. The working expenditure was 24,880,000 lats, and the operating ratio was 105 in place of 107 in 1931-32. The total capital invested in the 5 ft., 4 ft. 8½ in., 750 mm., and 600 mm.-gauge lines of the State system amounted to 344,160,000 lats. The number of passengers carried totalled 10,634,000 over an average distance of 43 km., and the goods traffic to 2,344,000 tonnes with an average haul of 113 km. At the end of the year there were in service 310 locomotives, 860 passenger vehicles, and 5,807 goods wagons. The maximum permissible speed on the State Railways is 85 km.p.h. (53 m.p.h.).

BRAZIL

The Plight of the Railways

In the course of an article, the technical *Revista das Estradas* gives the following comparative figures relating to 1929 and 1932, the last year for which financial results are available:—

	Contos	
	1929	1932
Great Western	38,826	28,674
Eastern	21,664	15,019
Central	184,139	155,680
Leopoldina	99,849	75,829
São Paulo	102,982	78,344
Paulista	105,668	102,372
Mogyana	60,496	43,331
Sorocabana	83,031	67,890
São Paulo-Rio Grande ...	40,244	31,704
Rio Grande do Sul ...	76,073	61,235

The aggregate decrease is thus 152,894 contos (£2,500,000) at the present rate of exchange. Figures for 1933 are expected to be even lower.

The article goes on to stress the value of railways as pioneers for developing the country, and the fact that over half a million people were directly, and many more indirectly, dependent upon the railways for their livelihood. Government was therefore urged not to remain indifferent to the plight of this vital industry. Means indicated whereby assistance could be afforded to it were by permitting relaxation of excessively rigid legal obligations and by

taking measures to enable railways to combat uncontrolled road competition by applying statutory rules and limitations equally to road transport.

New Locomotive

The Central Purchasing Commission has called for tenders for the supply of a Mikado type locomotive to the Ceará Railway, which is of metre gauge. The specifications include:—10,000-kilo. tractive effort; 11 to 12 kilos.p.cm. working pressure; weight of engine in working order 52 tons and engine and tender 80 tons. Delivery is required at Fortaleza, the port and capital of the State of Ceará.

INDIA

Development of Fruit Traffic

Special efforts were made by the M. & S.M. Railway administration during the year 1933-34 to develop the movement of traffic in fresh fruit in van loads by passenger train. Special rates were offered for the transport of plantains from South India to import centres in the north, but merchants did not avail themselves of these to any great extent. More encouraging results were, however, obtained from the special rates quoted for the conveyance of oranges in van loads from Nagpur to Madras and for plantains and melons from stations on the East Coast to Hyderabad.

Indian Railway Policy

Sir Guthrie Russell, Chief Commissioner of Railways, in reply to points raised by the South India Chamber of Commerce, and recorded in THE RAILWAY GAZETTE of October 12, stated that the constitution of a statutory Railway Board would help to keep the administration of railways free from political influences and also to facilitate a more economical and efficient working of railways. On the constitutional changes would depend the question of amending the Railways Act, but if the changes were too long in coming, it was possible that the amendment might be proceeded with.

The Mysore-Coimbatore railway scheme was included in the new projects under consideration by the Railway Board. The consummation of this line would provide a useful connection between the south and north of India via Mysore and Poona, but much depended upon the initiative of the Mysore Durbar. Sir Guthrie considered that the suggestion for a through metre gauge connection between Delhi and Rameswaram was impracticable.

On the question of reduction of fares, he stated that if the results of the experiments under trial on the North Western and the Great Indian Peninsula Railways proved satisfactory, the scheme might be extended to other railways. Both passenger and goods traffic during the last year showed a tendency to improve, particularly on railways in South India. On the Eastern Bengal Railway, experiments in cheaper return and season tickets were being tried.

Sir Guthrie Russell and Mr. P. R. Rau, Financial Commissioner of Railways, also recently discussed railway problems with the representatives of commercial bodies in Calcutta. The Indian Mining Federation represented the difficulties of the Bengal and Bihar mining interests on account of the continuance of the 15 per cent. surcharge on freight and the lower scale of freights for C.P. coal. Sir Guthrie pointed out that the volume of coal traffic had not fallen off in 1933-34. He promised, however, to consider the suggestion for the levy of surcharge at a fixed rate for all distances. As the question of railway freights on coal from the Korea fields was under inquiry by the Rates Advisory Committee, he was unable to discuss the matter of equalisation of the basic rate for C.P. coal. The Railway Board considered that there could be no reduction in the basic rate unless the railway earnings showed a definite improvement and came to the normal level.

GERMANY

Reichsbahn Timetable Conference

The Timetable Conference of the Reichsbahn, which was held at Stuttgart from August 27 to September 1, has worked out the fundamentals for international negotiations in regard to fast connections from Warsaw via Breslau, Dresden, Nuremberg, Stuttgart, and Strassburg to Marseilles and Paris, with a branch from Stuttgart via Zurich to Genoa.

A total distance of 100,000 km. (about 62,000 miles) will be covered by an express train without passengers, which is to be run at a speed of 72—90 m.p.h. between the stations of Stendal and Salzwedel. There an experimental section has been laid with welded rails forming 30 m. = 98·4 ft. lengths, to study the mutual influence of permanent way conditions and high speed. The train is to make 10 runs daily in each direction.

A Race Traffic Problem

An interesting traffic problem with which the Reichsbahn is faced is the handling of the large crowds attending the International motor races on the Nuerburg Ring. These races attract more than 100,000 people every year. The nearest railway ends at the small town of Adenau which is 1¼ hours walking distance from the ring. Even the line connecting Adenau with Dumpelfeld, is a short single-track section, and the only line connecting the Rhine with Dumpelfeld is a secondary double-track section with steep gradients winding through the picturesque Ahr river valley. Adenau station has only 6 tracks, so that the empty trains have to be taken 4·7 miles back to Dumpelfeld over the single track to be stabled till they are required for the return journey. There are no subways at Adenau station; the de-training and entraining of passengers, therefore, aggravates the situation. On July 15 last, 15 trains carrying over 10,000 passengers arrived at Adenau in the early forenoon, 14 of which were taken back to distant sidings. The total number of return trains was 19, and it is estimated that they carried 13,000 passengers. A large number of motorists are said to have preferred rail transport to their own cars to avoid the few very congested roads of access to the Nuerburg Ring.

DENMARK

Continuous Brakes

The present position on the Danish State Railways is that almost all ordinary goods stock used for internal traffic is still fitted only with hand brakes. Goods vehicles used on the through services with Sweden and Germany are, however, equipped with compressed air brakes, or are piped, as those countries use this type of brake. At the same time, a certain number of vehicles is fitted with the vacuum brake. Although no final decision has been arrived at on the subject, it is believed that the ordinary internal stock will also eventually be fitted with compressed air brakes or piped in the proportion of ⅓ to ⅔, and that for the sake of conformity the coaching stock—which is at present vacuum fitted—will be converted to compressed air. New wagons and locomotives are being air-brake equipped. The approximate numbers of vehicles are as follow:—

Total wagons	11,700
Continuous brake fitted	3,300
Compressed air brakes or piped ...	2,900

The introduction of compressed air brakes for all goods trains involves a heavy capital outlay, whereas it is considered that only a small saving in working expenses can be obtained; the train crew cannot be much reduced, as the staff at intermediate stations has been cut down to such an extent that the train crew must do most of the loading and unloading.

At present therefore capital is being devoted almost entirely to diesel and electric stock in preference to continuous brakes. However, when funds permit, it is intended gradually to equip 1,800 wagons—in addition to the 1,200 already fitted—with the compressed air brake and to fit the remaining 8,700 with pipes. Next the locomotives will be equipped and finally the coaching stock.

THE FAR EAST

Harbin-Lafar Railway

The Harbin-Lafar railway—the construction work of which was delayed by floods in the neighbourhood of Harbin—was expected to be opened to traffic on September 1. [This opening was subsequently reported by telegram from Harbin to have taken place on that date.—ED. *R.G.*]

IMPROVING THE APPEARANCE OF THE LINESIDE, L.N.E.R.

Former waste spaces, now converted into ornamental gardens, provide an attractive foreground to the scenery in the North Eastern area of the L.N.E.R.

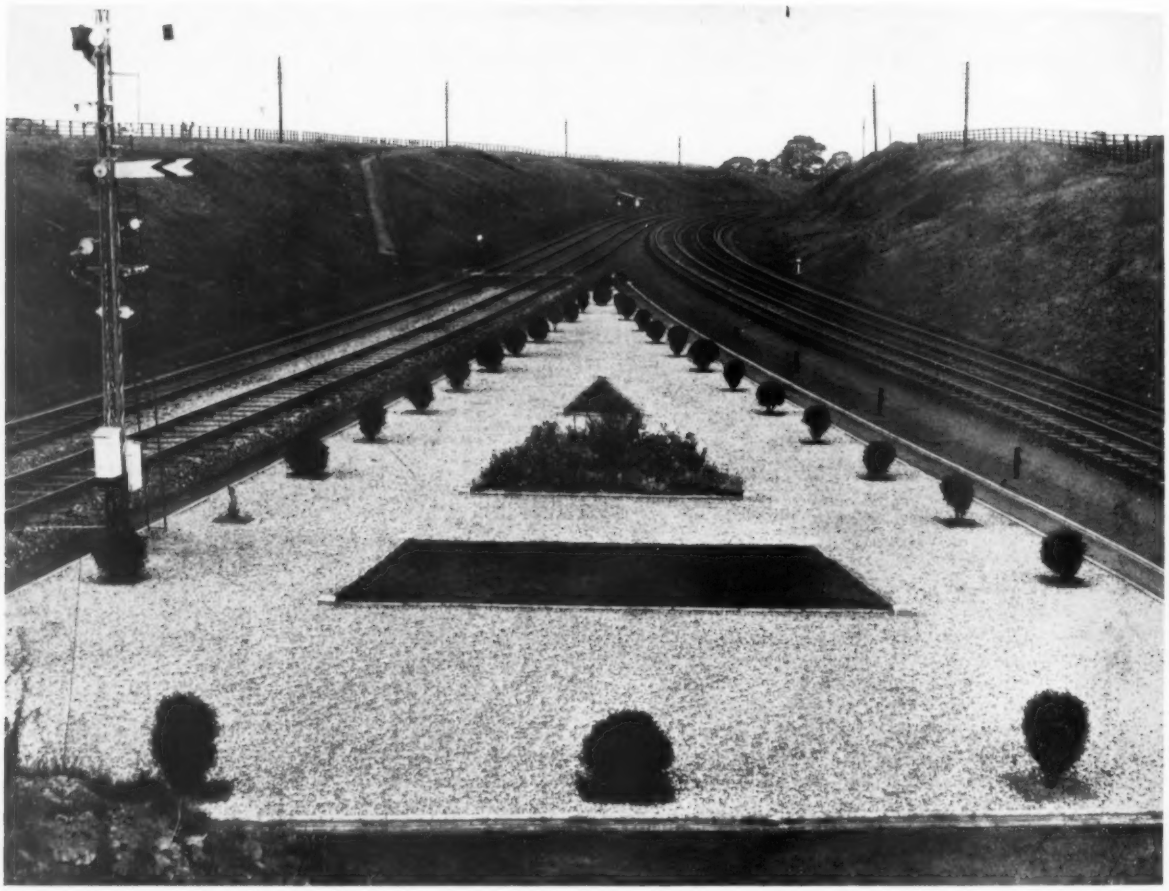
A view of York station from the south

THE scenic superiority enjoyed in many instances by the railways over the roads has become more noticeable as great arterial highways have developed and the motorist has been diverted in increasing numbers from the old picturesque thoroughfares to the modern by-pass with its mushroom villas and filling stations. Even so, railway scenery not infrequently suffers from being seen across the drab foreground of an uncared for lineside. We have already discussed, in THE RAILWAY GAZETTE of July 20 last, the architectural renaissance on the L.N.E.R. between York and Northallerton, where, in connection with the widenings, the design of the new buildings and their adjuncts has been studied to promote a cheerful appearance, and in the following pages we now reproduce illustrations showing further measures undertaken in this area by the same company with a like object in view.

The planting and maintenance of the lineside gardens and other forms of horticultural decoration acts as a psychological encouragement towards method and orderliness on the part of the staff as well as a stimulus towards increased patronage of the railway. A neat pattern of pre-cast concrete curbing, as has been standardised for the embellishment of stations, acts as an attractive frame for these additions to lineside scenery.

It will be observed from the photographs we reproduce that the scheme has been carried out boldly and with artistic discretion. There is no hint of the aspidistra school of decoration. The fine sweep of lawn and garden seen in the view on page 623 of the line between Cullercoats and Whitley Bay typifies the spirit of the enterprise and will be appreciated not only by travellers but by residents in the houses overlooking the line. Not the least attractive aspect of the undertaking is its potentiality for promoting the goodwill of the public towards the railway.

It is to the enterprise of Mr. John Miller, Engineer, North Eastern Area, L.N.E.R., that credit is due for the comprehensive application of this idea in England. A similar enterprise by the Pennsylvania Railroad, of the U.S.A., has been in existence for many years past.



The junction of the East Coast main line with the Durham and Sunderland branch

Ouston junction on the East Coast main line

IMPROVING THE APPEARANCE
(See article

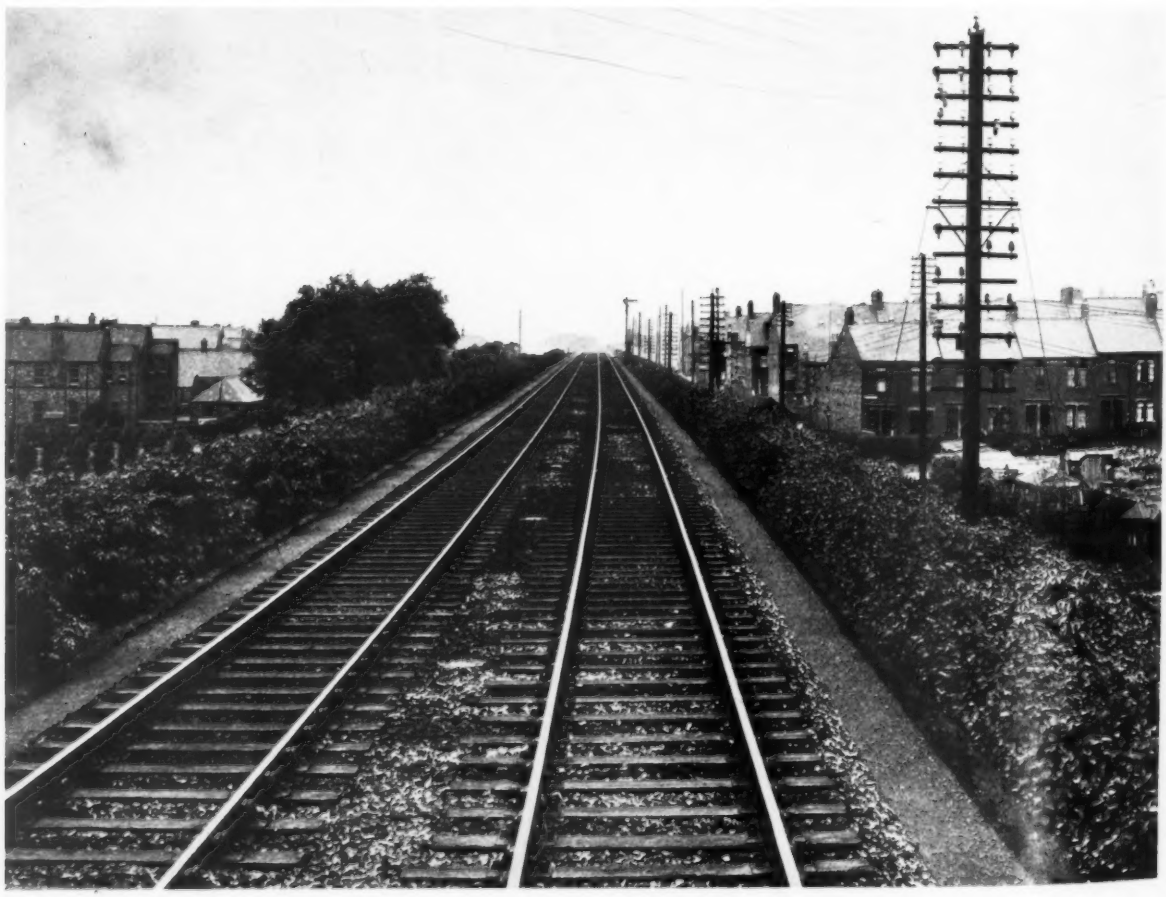
The approach to King Edward bridge over the Tyne

A view between Cullercoats and Whitley Bay

OF THE LINESIDE, L.N.E.R.

(on page 621)

The East Coast main line near Bensham station



The East Coast main line between Bensham and Newcastle

IMPROVING THE APPEARANCE OF THE LINESIDE, L.N.E.R.

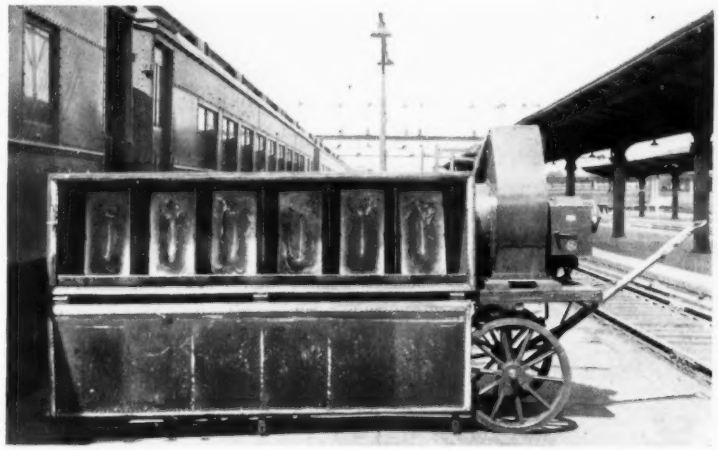
(*See article on page* 621)

AIR CONDITIONING OF TRAINS—III

In this article the use of ice is described

By STUART MIALL, B.Sc.

IN the last article on air conditioning,* passenger requirements were studied in some detail, and it became apparent that these could be met in every respect only at the cost of entirely remodelled carriages. Insulated walls, double glazed windows, concealed air ducts, a motor-driven refrigeration machine, a relatively high capacity axle-driven dynamo and a large storage battery were some of the features which that article would lead one to think of as necessary to successful air conditioning. In America, where disagreeable extremes of temperature occur with unfailing regularity every year, and where a six or eight hour railway journey would be deemed a short one, provisions no less elaborate have actually been made for ensuring the comfort of passengers on some of the best express trains. Preferable to the large capacity axle-driven generator, which necessitates a robust belt or gear drive, and imposes a very considerable additional load on the locomotive if fitted to every carriage in the train, is a diesel-generator set of sufficient capacity to serve 12 or 13 carriages. This can be started long before the locomotive is attached. By its help therefore the train can be pre-cooled and be kept cool during long waits. Without it a large and heavy storage battery is needed to make the train self-contained. Sometimes it is possible to connect the train up to an electricity supply at the stations where it must wait, and sometimes again pre-cooling is achieved as shown in Fig. 1 by a blower mounted with an ice box on a portable truck, but the self-contained train possesses obvious operating advantages, and a diesel-generator, while enabling these advantages to be secured can, if made large enough, overcome once and for all the kindred problems of supplying an adequate current to the electric cookers of the dining car kitchen.



Portable carriage pre-cooling outfit on an American railway

* THE RAILWAY GAZETTE of September 7. The first of the series appeared in the issue of June 29 last.

Pre-cooli[illegible] an American carriage with iced air

Cooling by Ice

While the use of a motor-driven vapour compression refrigeration machine on each carriage is common practice in America, the carrying of ice is also an established method of meeting hot weather requirements in the States. An obvious advantage of this method is that it does away with the use on trains of relatively complex and expensive machinery destined to remain idle throughout the greater part of the year. Ice can be bought as and when required, an inexpensive container made in the form of a simple heat exchanger, being provided for its reception under the carriage. Power is needed only for relatively light pump and fan duties.

In the A.C.F. Thermo Gravity System as used in the dining cars on the "Golden State Limited" on the Chicago Rock Island & Pacific Railroad, $\frac{1}{3}$ h.p. only is needed for circulating water between air cooling elements within the carriage and the ice box, and an equal amount of power is used to operate the fans in the air conditioning unit. The bulk of the air handled by these fans is re-circulated air, but a certain percentage (which can be varied at will) is fresh outside air drawn in through filters. The air entering the cooling element imparts any heat it has recently acquired to the cold water passing through the element. This water, having had its temperature slightly elevated, is then sprayed into the ice box where it causes some of the ice to melt and is itself made colder. It is then pumped in the cooled state back to the air conditioning unit to pick up a fresh supply of heat.

In the A.C.F. system the air is washed by cold sprays in the conditioning unit, but only when it has been cooled to a point where any moisture that may be left in it

will correspond to a state of saturation and so prevent the absorption from the spray of any more. The fresh outside air which is quite warm when first admitted is drawn in through dry filters and is not washed until it has been thoroughly chilled and so rendered incapable of taking up any considerable quantity of moisture. The spraying of the air when warm would, as described in the last article, only add to the amount of moisture to be condensed out by the cooling elements, and, for every extra pound of water to be deposited in the cooler, about 12 lb. of ice would have to be melted.

It may be suggested that the warm air would be chilled during the spraying process and that this would so far diminish the amount of chilling to be done by the cooler as to compensate for the liberation of the latent heat of the additional moisture. If measures were taken to ensure that all the heat for vaporising the moisture picked up by the warm air during spraying came from the air itself this would be true, but in a spraying chamber in direct communication with the outside much of the heat would be drawn from without and the air temperature would not fall during spraying by an amount sufficient to effect proper compensation. The safest plan is the A.C.F. one of washing only chilled air.

In winter months the water spray is at 60° F. instead of 40° F. and steam heated air passing through it takes up enough moisture to ensure that the effective temperature is correct for the season of the year.

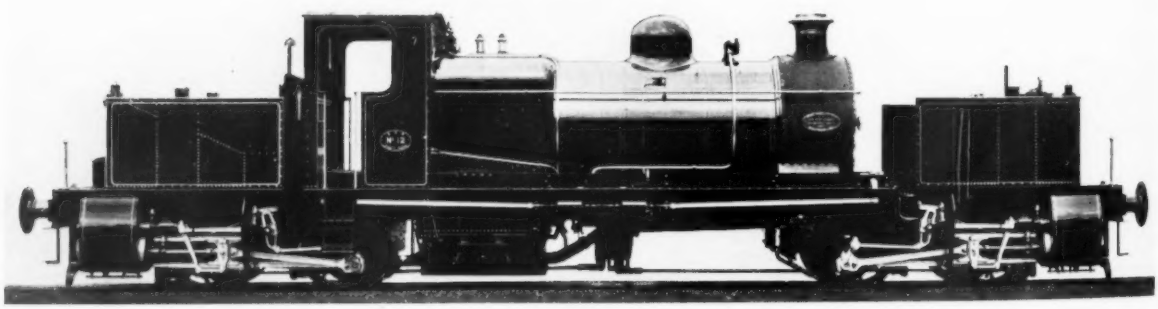
Operating Results with Ice

In the Rock Island diners mentioned above the ice consumption on the 2,400-mile run from Chicago to Tucumcari and back averages about 6,000 lb. per car during June, July and August, and about 3,000 lb. in September. The Chicago to Chicago time, which includes a wait of $2\frac{3}{4}$ hours at Rock Island, is $63\frac{1}{2}$ hours, but the plant is not steadily operative all this time. The ice bunker on each car holds eight 300 lb. blocks of ice so that during the single journey from Chicago to Tucumcari only one intermediate refilling is usually required. The conditions maintained inside the car are in conformity with passenger requirements as indicated on the comfort chart of the American Society of Refrigerating Engineers. Thermostatic devices keep the conditions constant between narrow limits, but the setting of these devices can be altered by hand so that due allowance can be made for the time of the year and the hour of the day. Plainly there will be a saving of ice (or in winter of steam) if conditions are permitted to depart from the ideal when the car is empty for long periods.

The American Car & Foundry Company has devised also what it calls a Thermo-Mechanical system. Here a motor-driven vapour compression refrigerating machine is used, the refrigerant being methyl chloride or Freon. The compressor takes 5 or $7\frac{1}{2}$ h.p. to drive it, depending on the application, and consequently an enlarged electricity generating outfit must be provided. With the Thermo Gravity system the power requirements are so small that standard equipment can be retained.

Whether the ice system be preferable to the compressor system will depend to some extent on the type and duties of the carriage. A dining car which is occupied for only a part of its running time would require only a modest quantity of ice, but a carriage to be occupied continuously might need more ice than could be conveniently carried or it might need too many stops for re-icing. With all its disadvantages then, the compressor system has a very definite sphere of usefulness, more particularly on routes where cheap supplies of ice are few and far between.

An Industrial Garratt



We are indebted to Beyer, Peacock & Co. Ltd. for the photograph, reproduced herewith, showing a 0-4-0 + 0-4-0 Beyer-Garratt locomotive, belonging to what is now called the Vivian type, by reason of the fact that the first engine of this class was delivered some ten years ago to the Vivian Copper Works at Swansea. A similar engine was supplied to the Sneyd Colliery about three years ago, and the one illustrated was delivered quite recently to the British (Guest, Keen, Baldwins) Iron & Steel Co. Ltd., at East Moors works, Cardiff. In this engine the boiler pressure has been raised from 180 lb. to 185 lb. per sq. in. and the diameter of the cylinders increased from $13\frac{1}{2}$ in. to 14 in., the result being seen in the development of a tractive effort at 75 per cent. boiler pressure of 27,200 lb. The wheelbase of each group of wheels is only 5 ft. 6 in. and the engine can negotiate 90 ft. curves and operate on 1 in 18 grade, at the same time possessing a larger output than most main line goods engines in this country. Compensated brake gear has been provided so that the engine can traverse vertical summits either in the concave or convex directions.

ROME-VITERBO RAILWAY RESULTS.—Competition from road services is stated to be influencing the financial position of the Rome-Viterbo line operated by the Società Anonima Romana per le Ferrovie del Nord, the accounts of which show a loss of lire 262,026 during the year ended December 31, 1933. This line, which was opened in its present reconstructed form on October 27, 1932, was described in our *Electric Railway Traction Supplement* for February 9 last.

RAILWAY NEWS SECTION

PERSONAL

SOUTHERN RAILWAY CONTINENTAL DEPARTMENT APPOINTMENTS

Mr. C. Cooper, Deputy Assistant for Continental Traffic to the Traffic Manager, Southern Railway, has been appointed Assistant to the Traffic Manager for Continental Traffic as from October 1 in succession to Mr. F. A. Brant who, as already announced, retired on September 30.

Mr. E. F. E. Livesey, who was Assistant for Special Continental Work, has been appointed Deputy Assistant to the Traffic Manager for Continental Traffic, Southern Railway, as from October 1.

Mr. E. G. Marsden has been appointed to succeed Mr. John R. Hind as Information Agent, L.N.E.R., with his office at King's Cross station.

The Transport Advisory Council, Ministry of Transport, has nominated certain of its members to the proposed Committee on Road Safety, under the chairmanship of the Rt. Hon. the Viscount Goschen, P.C., G.C.S.I., G.C.I.E., including the following:—The Rt. Hon. the Lord Ashfield, P.C., Sir Herbert Blain, C.B.E., Sir Alexander Kaye Butterworth, Mr. W. H. Gaunt, C.B.E., Mr. S. E. Garcke and the Rt. Hon. Sir Arthur Griffith-Boscawen.

Mr. H. C. Vickers, of Vickers, da Costa & Company, has joined the Board of the Hydraulic Coupling & Engineering Co. Ltd.

The University of Melbourne has conferred upon Sir John Cadman, G.C.M.G., a Director of the Great Western Railway, the honorary degree of Doctor of Engineering.

TOUR OF VICTORIAN GOVERNMENT RAILWAYS CHAIRMAN OF COMMISSIONERS

In March last Mr. H. W. Clapp accompanied by a Special Officer (Mr. R. G. Wishart) left Australia for an official tour abroad, to visit in turn the United States of America, Canada, Great Britain and the Continent of Europe. The mission is associated with recent important developments in rail, road and air transport and their possible application to Victorian problems. Mr. N. C. Harris has been appointed Deputy Chairman of Commissioners until Mr. Clapp returns in December next.

Mr. Charles Cooper, M.Inst.T., who, as recorded above, has been appointed Assistant to the Traffic Manager for Continental Traffic, Southern Railway, joined the Goods Department of the former London Brighton & South Coast Railway in 1886. In 1890 he was transferred to the Continental Traffic Manager's office and rose to be Chief Clerk to the Continental Traffic Agent in 1916. He became Continental Traffic Agent in 1919, in time to assist in the work of restoring the Newhaven-Dieppe route to its pre-war position, following the release in that year of the port of Newhaven by the military and naval authorities. After the grouping in 1923, Mr. Cooper was made Deputy Continental Assistant to the Chief Commercial Manager, Southern Railway, taking up the same position with the Traffic Manager in 1930. This post he now vacates to succeed Mr. Brant as Continental Assistant. He is a Member of the Institute of Transport.

Mr. C. Cooper, M.Inst.T.,

Appointed Assistant to the Traffic Manager for Continental Traffic, Southern Railway

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Dr. Victor Tann, sometime Manager of the Central of Brazil Railway, has been appointed by the Government of Minas Geraes to be Superintendent of the Rêde Mineira de Viação, the railway which it works on behalf of the Federal Government.

From the *London Gazette*:—Movement Control Staff (Railway & I.W.T.): Captain Ralph Arnold Smith to be Captain (August 7).

Señor Eduardo Maristany, who for many years has been General Manager of the Madrid, Saragossa and Alicante Railway, (M.Z.A.), has asked to be retired on pension, and the Board of Directors, have accepted his resignation. In view of his long years of service, he has been appointed Honorary General Manager of the company, and will also continue to act as Director on the Board at Barcelona. Señor Maristany's post will be filled by Señor Eduardo Alfonso, who for some time past has held the office of Deputy Manager.

INDIAN RAILWAY STAFF CHANGES

Mr. W. M. Cargill, Deputy Chief Engineer, Signals, N.W.R., has been permitted to retire from Government service as from August 11.

Mr. A. M. Sims has been appointed to officiate as Deputy Chief Engineer, Bridges, N.W.R., as from July 31.

Rai Bahadur N. C. Ghosh has been appointed to officiate as Divisional Superintendent, E.I.R., as from August 16.

Mr. R. Tate, who, as announced in our issue of October 12, is shortly retiring from the position of District Goods and Dock Manager, West Hartlepool, L.N.E.R., after a service of over 50 years, began his career in the Mineral Department, N.E.R., and in 1892 was transferred to the District Goods Manager's Office at Leeds. When, subsequently, the staff of the Leeds and York District Goods Manager's Offices were combined, under the reorganisation scheme of 1902, Mr. Tate was given charge of the mineral section at York. In the year 1907 he was appointed to the Works Section of the Chief Goods Manager's Office, York, and two years later took up the position of Sack Superintendent. When the Sack Department became a section of the Chief Goods Manager's Office he was given special work at Leeds under the District Goods Manager. In the year 1913 he was appointed Goods Agent at Harrogate, with supervision of the commercial work at Harrogate and Starbeck, returning to Leeds as Chief Clerk to the District Goods

Manager. Later he took up a similar position at West Hartlepool and in the year 1919 was appointed Assistant District Goods and Dock Manager at that place. In 1921 he was appointed Assistant District Superintendent at Hull, and in May, 1923, became District Goods and Dock Manager, West Hartlepool, L.N.E.R., so that up to the time of his retirement he will have held this position for 11½ years.

Photo by [*Lafayette*

Mr. R. Tate,

District Goods and Dock Manager, West Hartlepool, L.N.E.R., 1923-34

We regret to record the recent death of Mr. E. C. Blackmore, late Works Manager, Taff Vale Railway.

Mr. E. F. E. Livesey, who, as announced above, has been appointed Deputy Assistant to the Traffic Manager for Continental Traffic, Southern Railway, entered the service of the South Eastern & Chatham Railway in 1906, joining the Secretary's and Estate Department of the Chatham & Dover Section. In 1910 he was attached for some months to the company's Brussels office to gain Continental experience, and was subsequently transferred to the office of the Superintendent of the Line. On the outbreak of hostilities Mr. Livesey proceeded to France under the Railway Transport Directorate, and was twice mentioned in despatches and awarded the O.B.E. On relinquishing military service with the rank of Lieutenant-Colonel he became Assistant to the Paris Agent of the South Eastern & Chatham Railway, and on the grouping of railways returned to England as General Assistant to the Chief Operating Superintendent of the Southern Railway. In 1928 Mr. Livesey was sent to America as representative of the Southern Railway in the U.S.A. and Canada, and on his return in 1931 was attached to the office of the Continental Assistant until July, 1933, when he was appointed Assistant for Development, Traffic Department. In January last only, he became Assistant to the Traffic Manager for Special Continental Work, Southern Railway.

Mr. E. F. E. Livesey, O.B.E.,

Appointed Deputy Assistant to the Traffic Manager for Continental Traffic, Southern Railway

Colonel Harry A. Stenning, O.B.E., T.D., M.I.Mech.E., for many years Managing Director of the Superheater Co. Ltd., is retiring from that position at the end of this year. His long connection with superheating will, however, not be severed, as he retains his seat on the Board, acting as Consultant to the company. Mr. Eric A. Robinson, General Manager, has been elected a Director of the company.

Col. Harry A. Stenning, O.B.E.,

Retiring Managing Director, The Superheater Co. Ltd.

Colonel Stenning received a locomotive training under the late Mr. James Stirling at Ashford, and afterwards was employed on the London & South Western Railway under the late Mr. Dugald Drummond. He then turned his attention to other branches of engineering, where he came into contact with the late Mr. L. S. Robertson, the first Secretary of the Standardisation Committee. He it was who introduced Colonel Stenning to Dr. William Schmidt, the originator of the practical high-temperature superheater. As a result, Colonel Stenning took up the superheating business and, with Mr. Robertson, started the Schmidt Superheater Company in this country. The first British locomotive fitted with a high-degree superheater—which like all others at that time was of the Schmidt type—was one of Mr. Hughes' 0-6-0 Lancashire & Yorkshire Railway goods engines. Better known among the earliest classes of locomotive to be so fitted was Mr. D. Earle Marsh's London Brighton & South Coast 4-4-2, L, express tank engine. This class gained such fame in the locomotive exchange with the London & North Western that that railway subsequently adopted superheating. At the same time as the L.B.S.C. engines were fitted, Colonel Stenning introduced the system to the following railways:—Great Northern, Great Central, Midland and Caledonian, all of which had engines fitted as a trial and all of which have since adopted the system. In 1914 the company built its existing works at Trafford Park, Manchester, and during the war period was engaged in the manufacture of munitions. After the war, as a British firm, under the name of Marine & Locomotive Superheaters Limited, the company commenced the manufacture of superheater apparatus and introduced the present type of machine-forged return bends, which

Mr. J. Young,

Appointed Operating Superintendent, L.M.S.R., Northern Counties Committee

entirely replaced the older method of acetylene-welded ends in the design of superheater elements. In 1924 the firm again changed its name to The Superheater Co. Ltd., and its business grew rapidly, not only with railways, but even more so with electricity supply undertakings and marine engine builders, until in the years prior to the depression some 2,000 tons of tubes were converted into superheaters of all kinds annually. What is more, trade has now so far recovered that already about 1,800 tons have been fabricated at Trafford Park to date since January 1 last. The development of the high-degree superheater as applied to locomotives in this country has, in fact, been the life work of Colonel Stenning since 1905, and his remarkable personal success is reflected not only in its almost universal adoption, but also in the growth of the company's organisation.

Mr. John Young, who, as announced in THE RAILWAY GAZETTE of October 5, has been appointed Operating Superintendent, L.M.S.R., Northern Counties Committee, was educated at Marlborough. After leaving school he entered the locomotive shops of the Belfast & Northern Counties Railway, at Belfast, where he served his time for five years and also had 18 months' experience in the drawing office. In 1927 he was appointed Traffic Inspector and was transferred to Derby for six months. Two years later Mr. Young became Bus Services Outdoor Inspector, and was appointed Head Office Inspector in 1934.

From *The London Gazette*, October 16, 1934:—Regular Army, Supplementary Reserve of Officers, Royal Engineers. Transportation—Colonel Sir Herbert A. Walker, K.C.B., T.D., Engineer and Railway Staff Corps, T.A., to be Honorary Colonel, October 17, 1934. Sir Herbert Walker has been Colonel Commanding the Engineer and Railway Staff Corps since 1924, but is better known as General Manager, Southern Railway.

R.C.H. SUPERINTENDENTS' CONFERENCES

At a meeting of the Superintendents' Conference at the Railway Clearing House on Wednesday, the following were unanimously elected Chairmen of the Superintendents' Conference for the year 1935:—

Coaching Traffic Superintendents' Conference.—Mr. E. C. Cox, Traffic Manager, Southern Railway.

Operating Superintendents' Conference.—Mr. F. Bushrod, Superintendent of Operation, Southern Railway.

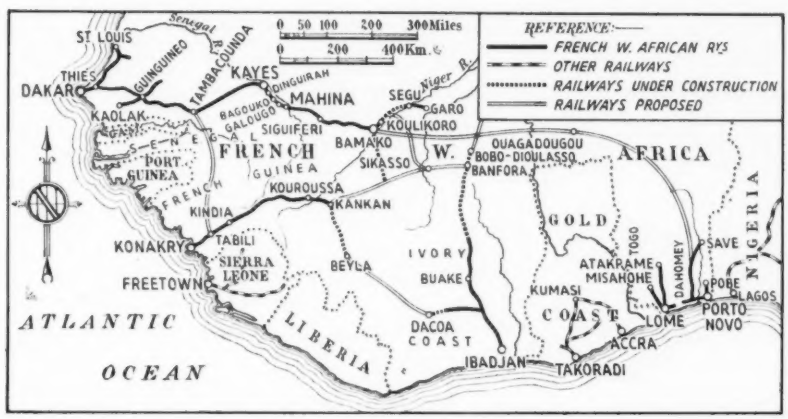
We regret to record the death, on October 13, of Mr. Robin d'Erlanger, a Director and son of Baron Emile d'Erlanger, Chairman of the Channel Tunnel Company and also a Director of the Beira Railway. A requiem mass in his memory was said at St. Mary's, Moorfields, on Wednesday. Among those present were:—

Mr. C. McL. Carey, Secretary and London Manager, Trans-Zambesia Railway; Mr. Charles Sheath, Director, Southern Railway; Mr. T. H. Cramp, Secretary, Channel Tunnel Company; Mr. Stanley Adams, T. Cook & Son; Mr. A. J. Lavington, Secretary, Beira Railway; Mr. R. E. Fitzgerald, London Manager and Secretary, Rhodesia Railways; Mr. C. E. R. Sherrington, Secretary, Railway Research Service.

Mr. E. J. Wearing has retired from the position of European Express Agent, Canadian National Railways, after 47 years' continuous service.

Reconstruction on the Dakar-Niger Railway

The construction of what is now the Dakar-Niger Railway of French West Africa was undertaken at two periods and for different purposes. Military operations in the French Sudan showed up the need for rapid communication between the navigable portions of the Senegal and Niger rivers in 1881, when work upon the Kayes-Koulikoro section was started purely for strategic reasons. It was not completely opened for traffic until 1906, after which it rapidly acquired commercial importance. The value of the line in this direction, however, was limited by the fact that traffic could be conveyed only down the Senegal river to the coast for some three or four months of the year. It was consequently decided to provide Kayes with a direct rail outlet to the Atlantic, and a new line thence to Thies, connecting there with an existing route to Dakar, was built between 1907 and 1923.



Sketch map of the railways of French West Africa

Whereas this second section was constructed with commercial ends in view, the military objects envisaged by the builders of the earlier Kayes-Koulikoro division had resulted in a line laid with light rails and severe curves over heavy gradients, and quite inadequate for dealing with modern traffic. The situation is summed up in a special colonial number of our French contemporary *Science et Industrie*, where it is stated that trains worked as single units by one Mikado locomotive from Thies to Kayes have usually to be divided into three for the journey thenceforward owing to the severity of the route and the limited engine power that can be used. Since 1925, therefore, work has been in hand upon the amelioration of the most difficult sections. Deviations were undertaken at Siguiferi, at kilometre 730 (counting from Thies), near Galougo, and at Bagouko and Dinguirah. The underlying principles were the easing of the ruling gradient from 25 mm. to 15 mm., the alteration of curves from radii sometimes as small as 150 m. to a minimum of 500 m., the strengthening of bridges and the substitution of standard 26 kg. rails for those of 20 kg. originally laid.

Such measures were of local importance only and could not improve the working conditions of the line as a whole. In 1929 a programme of general reconstruction was drawn up, based upon the foregoing, but with modifications. The radius of curves is still normally restricted to a minimum of 500 m., although 300 m. is allowed in exceptional circumstances. The ruling grade is further reduced to 10 mm. and relaying is taking place with 30 kg. Vignole Standard rails.

The total cost of the work is estimated at 224 million francs, and the speed at which it is being undertaken has had to be relaxed as a result of the economic crisis. It had been hoped that the reconstruction of the first section to be tackled, that of 113·4 km. between Kayes and Mahina, would be complete by the end of 1933, but it is not now expected until some time in the course of next year.

Census of Railway Employees

As noted last week a return has been issued showing (1) the number of staff employed by the railway companies of Great Britain, the Railway Clearing House, and on the railway undertakings of the London Passenger Transport Board during the week ended March 10, 1934, and (2) a comparison of the rates of pay and average weekly salary or wage of, and average weekly payments to, certain selected grades during the weeks ended March 10, 1934, and March 11, 1933.

Details are given of the number employed in each of the principal grades by the four amalgamated companies, certain committees, London Transport and the Clearing House, with totals for each undertaking and for Great Britain. Male and female employees are shown separately, and, with the exception of staff not employed directly, *e.g.*, staff employed by contractors, all persons in the service of the railway undertakings mentioned during the week of the census are taken into account. The figures represent the number of staff receiving salaries or wages for the full week combined with the equivalent number of full-time workers in cases where employees were paid for less than the complete week.

The average payments to certain of the adult male staff were shown by the returns received to be as follows:—

	Week ended— March 10, 1934	March 11, 1933
Staff entered at salaried rates:—	s. d.	s. d.
Clerical, supervisory, &c., staff (exclusive of officers and of staff entered under ancillary businesses) ...	89 11	89 7
Staff entered at wages rates (excluding staff entered under ancillary businesses):—		
Conciliation staff ...	62 8	62 2
Shop and artisan staff	67 0	64 11

The average payments represent salaries or wages, residual bonus (if any), war wage, piecework payments, tonnage bonus, payments for overtime, Sunday duty, night duty, commuted allowance and any other payments for work performed, but exclude compensation allowance, travelling and out-of-pocket expenses, and meal and lodging allowances. At the time the census was taken the deductions operating by agreement as from March 28, 1931, were in force.

Summary of Total Staff Employed

Name of Company	At March 10, 1934	At March 11, 1933
G.W.R.	96,642	96,436
L.N.E.R.	169,772	166,714
L.M.S.R.	219,616	215,509
Southern	62,807	60,619
Cheshire Lines	3,962	4,063
London Transport ...	14,220	14,993
M. & G.N. Joint ...	2,079	2,092
Railway Clearing House	1,887	1,995
Other companies ...	4,063	3,879

The following table gives the numbers employed in each of the principal grades and in ancillary businesses during the selected week in 1934, with the corresponding numbers for the selected week in 1933:—

Male Staff	1934	1933
Railway Staff:—		
Capstanmen	1,238	1,227
Carters and vanguards	22,632	21,094
Carriage cleaners ...	6,395	6,367
Carriage and wagon examiners	4,158	4,175
Carriage and wagon oilers and greasers	1,843	1,854
Checkers	8,870	8,779
Cranemen	484	472
Crossing-keepers ...	1,301	1,320
Engine cleaners ...	7,970	10,322
Engine drivers and motormen	33,265	32,171
Firemen and assistant motormen	30,624	29,832
Foremen and chargemen	6,979	7,139
Guards—goods ...	13,311	12,906
Guards—passenger ...	7,308	7,339
Hydraulic and pumping engine staff ...	922	987
Labourers	22,153	20,567
Lampmen	1,834	1,872
Loaders, callers off, ropers and sheeters	5,616	5,533
Locomotive shed staff (excluding labourers)	8,710	8,480
Messengers	887	880
Number-takers ...	1,930	1,904
Officers and clerical staff...	62,334	64,989
Permanent-way men	54,195	54,626
Pointsmen	290	293
Police staff:—		
Supervisory grades	150	155
Other grades ...	2,198	2,234
Porters:—		
Goods	13,717	13,155
Passenger	23,262	23,047
Porter guards ...	575	574
Porter signalmen ...	2,132	2,072
Shop and Artisan Staff:		
Supervisory grades	2,474	2,591
Other grades (excluding labourers and watchmen)	91,937	84,702
Shunters	16,301	16,102
Shunt-horse drivers ...	313	362
Signal and telegraph men	5,638	5,974
Signalmen	25,032	25,537
Signal-box lads ...	1,484	1,502
Stationmasters, yardmasters, &c. ...	5,233	5,323
Supervisory staff (other than shop and artisan and police)	9,509	9,885
Technical staff ...	2,775	2,942
Ticket collectors ...	3,665	3,787
Traffic control staff ...	1,414	1,416
Watchmen	393	402
Miscellaneous grades	10,258	10,107
Administrative and technical staff (not allocated)	1,020	—
Railway total ...	524,729	516,997
Ancillary Businesses:—		
Canal staff	1,201	1,202
Dock and quay (other than shop and artisan) staff	11,809	11,552
Marine (other than shop and artisan) staff...	4,211	4,162
Marine and dock shop and artisan staff ...	3,618	3,696
Omnibus and passenger road vehicles:—		
Conciliation staff—traffic department	33	171
Hotel, refreshment room, dining car and laundry staff	7,440	7,222
Total—Ancillary businesses ...	28,312	28,005
Total — Male staff	553,041	545,002

Female Staff	1934	1933
Railway:—		
Carriage cleaners ...	514	456
Clerical and technical staff...	9,307	8,994
Crossing-keepers ...	1,560	1,546
Office cleaners and charwomen ...	2,803	2,807
Shop and artisan staff	1,038	894
Waiting room and lavatory attendants ...	545	549
Miscellaneous grades	411	395
Administrative and technical staff (not allocated)	215	—
Total	16,393	15,641
Ancillary Businesses:—		
Hotel, refreshment room, dining car and laundry staff ...	5,432	5,461
Marine staff	182	196
Total—Female staff	22,007	21,298
Grand total—All staff	575,048	566,300

Franco-Polish Railway Results

The 350-mile Franco-Polish Railway, built in 1926-33 at a cost of 365,000,000 fr. to provide a direct all-Polish route from the Silesian coalfield to the Baltic port of Gdynia, was opened throughout to traffic on March 1, 1933, and during the next ten months the coal traffic amounted to 100 million tonne-km., which represented 62 per cent. of the total goods and mineral traffic. In this period the receipts totalled 20 million zlotys and the working expenses to 14·5 million zlotys, but as interest charges amounted to 9·9 million zlotys, the Polish Government, by reason of the terms of the concession, had to find 4·4 million zlotys to cover the final deficit. It was intended originally that the Polish State Railways should work the line only until the end of 1933, but by a subsequent agreement the operation has been left in the State Railways' hands *sine die*. The question of doubling the whole line, and constructing a branch in the coalfield from Czestochowa to Siemkowice, is under consideration.

CLOGHER VALLEY RAILWAY—At a recent meeting of the Tyrone County Council, a report by the county surveyor on the portion of the Clogher Valley Railway in County Tyrone was presented. The report says:—"The second diesel unit came into service early this year, and the steam mileage is now only about 2,000 miles a month as against a diesel mileage of 9,000 a month. The present train service introduced in June is the best that has ever been given since the railway was first opened." A resolution was passed unanimously deprecating the suggestion contained in Sir Felix Pole's report to close down the Clogher Valley Railway. The railway, it was said, was performing a service which could not be replaced by motor transport without a great deal of extra expense being involved, which would be payable by the present users of the railway.

Indian Railway Conference Association

(From our own correspondent)

The annual session of the Indian Railway Conference Association opened at Simla on October 6 with Mr. J. Williamson, Agent of the Bengal & North Western Railway, in the chair. In the course of his presidential address Mr. Williamson reviewed many of the important railway problems of the day.

Reduced Railway Receipts

A significant feature of Indian railway working during the past few years was the continued fall in passenger traffic. Mr. Williamson said that all railways were watching with interest the effect of the reduced passenger fares that were on trial on two State railways. He, however, saw little hope of increase of railway income by lowering of rates and fares. Over the few years prior to 1914, the progressive growth of railway earnings gave a yearly increase of just over Rs. 4 crores. If the present encouraging upward trend continued, a balanced budget loomed in view, but the time was not opportune for any substantial reduction of rates and fares.

Railways and Air Services

Speaking of railways in relation to air services, the Chairman stated that the possibility of railways owning and operating air services had been examined, but no definite decision had yet been reached. The development of commercial aviation in India was expected to progress rapidly, and it was necessary that the railways should not hesitate to take active measures to co-operate with air services so that this important aspect in the development and speeding up of transport was not delayed.

Road Motor Competition

Mr. Williamson next referred to the report of the committee of the Conference Association, which had investigated the question of road competition. Among other conclusions, this committee observed that it was of the greatest importance that provincial governments should push forward as quickly as possible with the amendment of their rules under the Indian Motor Vehicles Act, in order that motor transport might be brought under effective regulation, inspection and control, similar to those imposed upon the railways under the Indian Railways Act. The necessity for such amendment was particularly urgent for light railways, which had been greatly affected by road competition. These light railways were unable to venture upon measures to improve their services unless conditions of competition were altered. The Government of the United Provinces recently published the rules they proposed to adopt to tighten up control of road transport. In many Indian States unrestricted road competition with the railways had been stopped by varying methods. In British India the passing of the Indian Railways Act Amendment Bill had given road powers to certain railways, but it was not possible for them to compete on the roads with private buses unregulated and uncontrolled as regards fares, time-tables and maintenance.

Referring to the obligation placed upon the railways to collect pilgrim tax on behalf of certain municipalities as putting the railways at a hopeless disadvantage with their competitors, Mr. Williamson remarked that the practice had an indirect as well as a direct and far-reaching effect on pilgrim traffic by rail. Pilgrims travelling by buses were immune from this tax and consequently chose the road in preference to the railway for travel to melas and places of religious interest. Moreover, in order to compete with motor transport in such circumstances, railways would have to reduce their fares to a point which transferred the burden of the tax from the pilgrim to themselves. The stifling effect of the tax on pilgrim traffic in general had yet another important aspect; the travel habit of the masses was largely centred in visits to religious melas and shrines, and any measure that tended to discourage such travel was hardly desirable.

Travelling without Tickets

Dealing with the constant leakage of revenue from the increasing number of passengers travelling without tickets, Sir Hugh Hannay last year aptly characterised such practice as a charge on honest travellers. In 1933, the number of persons detected without tickets on all railways was 2,900,000. It was estimated that the number detected was a negligible proportion of the delinquents. Mr. Williamson mentioned that on the Bengal & North Western Railway the recoveries made by ticket collectors during the last financial year amounted to 1·72 per cent. of the total passenger earnings. The actual losses, he thought, would exceed 5 per cent. of the passenger earnings.

Railway Administration Under New Constitution

Mr. Williamson thought that business men and legislators were coming to realise that the fullest measure of service that railways could render the country could be secured only by the entire dissociation of administrations from any influence that tended to affect their operation as purely commercial organisations expected to pay their way without being a burden on the taxpayer. It was hoped that the proposed statutory Railway Board, designed to secure this object, would succeed. But Mr. Williamson hazarded the prophesy that at no distant time India, with her diversity of peoples and their conflicting interests, would come to realise the many difficulties that beset the working of a commercial undertaking through the agency of a State department, a practice condemned by other countries in more favourable circumstances. Public opinion, so strongly in favour of nationalisation in 1920, would incline towards the views of the moiety of the Acworth Committee that favoured company management.

Economy

Turning to the subject of economy, Mr. Williamson said that the large economies forced upon the railways during the last four years had not been effected at the cost of efficiency. An important factor which led to a considerable rise in working expenses was the high import duty imposed upon practically all material used by the railways, especially on steel. The development of indigenous industries, which the high duties are designed to protect, was undoubtedly necessary to the growth of the country, but he hoped that the day was not distant when these industries would be able to compete on level terms with the outside world.

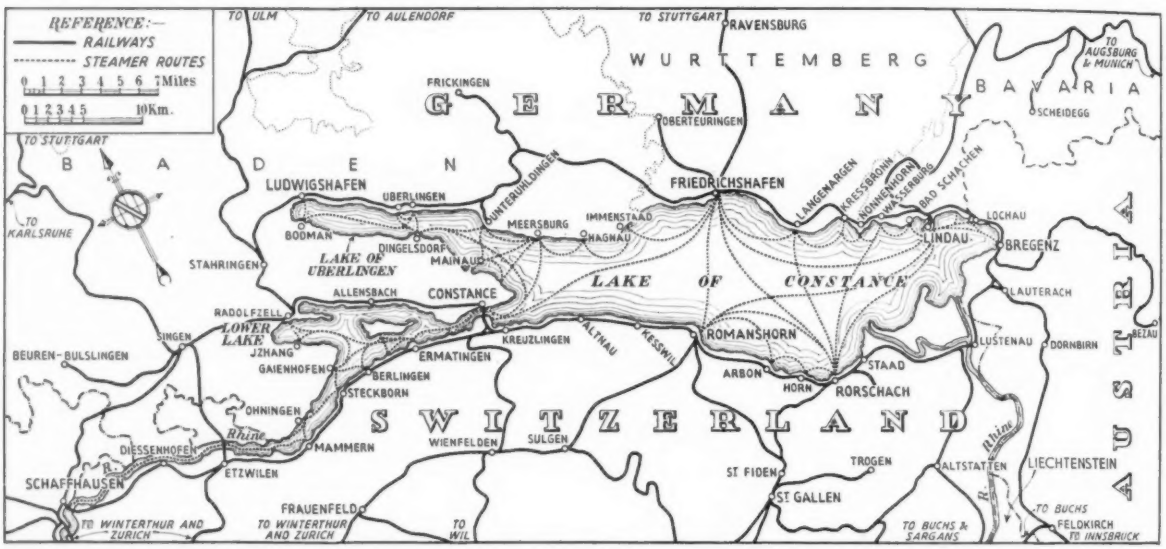
Referring to the laudable work of Mr. Pope and his associates, Mr. Williamson mentioned that a special value attached to their reports as having directed scrutiny into unexplored channels. He made special reference to the views of the committee on the necessity of elasticity in the structure of rates and fares. Also their observations on the substitution of light units with lower operating costs and greater frequency of movement for heavy passenger trains, were particularly interesting in connection with the efforts of the railways to cope with road competition. Mr. Williamson added that light train operation with reduced third class fares of just under 2 pies (⅛d.) a mile of single journey were introduced on the B. & N.W. some four years ago for the convenience of litigants and traders with encouraging results.

On the conclusion of the Chairman's speech, Sir Joseph Bhore, the Hon. Member for Commerce and Railways, and Sir Guthrie Russell, Chief Commissioner of Railways, addressed the Conference.

EXIDE MOTOR SHOW LUNCHEON.—A necessary concomitant of the Motor Show is the Exide Luncheon, which was held under the presidency of Mr. D. P. Dunne, Managing Director of the Chloride Electrical Storage Co. Ltd., at the Clarendon Restaurant on opening day at Olympia. The sale of Exide batteries was increasing with the expansion of the motor industry, as were also batteries for electric traction and for emergency lighting. Mr. Dunne pointed out that the mechanism which released the *Queen Mary* was operated by an Exide battery, and the broadcast of the launch had also the power of an Exide battery behind it.

The Steamer Services on the Lake of Constance*

The Lake of Constance, or the Bodensee, as it is called in German, is situated in the extreme south-west of Germany, touching its former States of Baden, Bavaria, and Württemberg, as well as Austria and Switzerland. The Rhine passes through it and then onwards by Schaffhausen towards the sea. The lake has a total area of about 540 sq. km.; its greatest length is 62 km., from Bregenz to Ludwigshafen, and its greatest breadth 14 km., between Kressbron and Rorschach.



Sketch map of the railway and steamer services in the Lake of Constance area

In the 18th and early 19th centuries, before the coming of steam power, there was a fairly lively goods traffic carried on across the lake in several directions by means of sailing vessels, for a number of important international merchandise routes converged at the towns on its shores. The passenger traffic, however, was almost negligible; the boats were far from comfortable and most travellers preferred going round the lake by road, though it often prolonged the journey. The first steam vessel on the Rhine appeared in 1816, and in 1826 the first one on the Lake of Constance was running between Friedrichshafen and Rorschach. The company owning it succeeded in obtaining a concession from the government of Württemberg giving it a monopoly of steamboat traffic for all places in its territory on the lake. In 1830 a second company, owning two vessels, was established in Constance and obtained a like privilege from the State of Baden. Bavaria entered the field in 1838, and twelve years later a Swiss steamer was put on to run between Schaffhausen and Rorschach.

The coming of railways into the district affected considerably the steamboat traffic. In 1847 the first line to reach the lake, from Ravensburg in Württemberg, was constructed to Friedrichshafen, being extended to the capital, Stuttgart, three years later. By 1863 two more lines to the lake had been opened, one constructed in 1853 from Munich and Augsburg and terminating at Lindau, the other through the Upper Rhine valley, terminating at Constance. By 1863 the Württemberg, Bavarian, and Baden steamboat lines had passed into the possession of the respective governments and had become incorporated in their railway systems. Before that, however, in 1855 the Swiss North Eastern Railway, on completion of its Zurich-Romanshorn line, had founded a steamboat undertaking. This railway acquired in 1857 the Schaffhausen-Winterthur railway line (built in 1853) and, after some minor changes had taken place, a concern known as the Swiss Steamboat Company was established in 1864. Austria did not enter the steamboat trade till 1884, after the completion of the Arlberg railway route, when the opening of the Bregenz-Feldkirch-Innsbruck line was followed by a boat undertaking working from the first named place.

The gradual development of the railway lines round the lake and the systems connected with them greatly contributed at first to the prosperity of the steamboat services, especially those running from one end to the other which served to form an important link in international routes. The principal services, which soon had to be run as regular lines, were from Friedrichshafen and Lindau to Romanshorn and Rorschach across the lake, and along it from Constance to Bregenz via Rorschach and to Lindau via Friedrichshafen. During these years the local short distance traffic was rather neglected, as the through route services proved so remunerative. In 1845, 102,840 passengers were carried, while in 1855 there were 225,017 and 444,430 in 1865.

At first the relations between the various operating concerns or administrations were quite amicable. Baden, Bavaria, and Württemberg tried to work harmoniously together, but eventually a foolish competition arose, with the usual wasteful and ruinous results. In 1855, however, the Swiss North-Eastern Railway made an agreement with the Bavarian government, by which the line between Lindau and Romanshorn was to be worked entirely by the former, and the Lindau-Rorschach service was to be shared between them. Some other agreements were also concluded, but an attempt at a general elimination of competition did not prove successful.

Until about the seventies the traffic on the boats steadily increased. By that time, however, additional railway lines had been built, such as the circular Bregenz-Lindau route and the south shore line, opened in 1872, from Constance to Bregenz *via* Romanshorn and Rorschach. This was continued to Etzwilen in 1875 and in 1895 it reached Schaffhausen. These lines took away almost all the end to end lake traffic from the boats and the corresponding direct services were discontinued. This caused those concerned to turn their attention to the encouragement of excursion and pleasure services and to provide more facilities for the smaller localities, especially along the north shore. In 1877 the United German

* Much of the information contained in this article is abstracted from a comprehensive and interesting account by Herr Nagel, in our contemporary the *Zeitung des Vereins Mitteleuropäischer-Eisenbahnverwaltungen*, in which the history of these services is dealt with in great detail.

Passenger Service was formed and this was joined by the Austrian concern at Bregenz in 1886. By the end of the last century circumstances had still further altered. Good railway services existed right round the lake on both shores and some steamboat services, such as the Ludwigshafen-Überlingen, had to be definitely abandoned, although the boats tried to retain as much traffic as they could by reorganising their services and providing more comfort for passengers.

In 1902 the Swiss-owned boats running between Bregenz and Lindau, neither of which places is in Switzerland, also came into the pooling arrangement. In the course of time, with the formation of the German State Railway and Swiss Federal Railways, the old agreements had to be completely revised. The position to-day in this matter is that: the German-Austrian Association, composed of the German State and Austrian Federal Railways, works the principal northern route Constance, Meersburg, Hagnau, Immenstaad, Friedrichshafen, Langenargen, Kressbronn, Nonnenhorn, Wasserburg, Bad Schachen, Lindau, Lochau, Bregenz; the German-Swiss Association (German State and Swiss Federal Railways) works the cross services between Lindau and Friedrichshafen to Rorschach and Romanshorn; the Arbon Association, really now the Swiss Federal Railways, works a service between Romanshorn and Rorschach via Arbon and Horn; and the German State Railway operates the service between Constance and Ludwigshafen, via Dingelsdorf and Bodman. All these services are on the lake proper or on the Überlingersee. On the Lower Lake the German State Railway works services from Radolfzell to Gaienhofen, Steckborn and Öhningen and the Schaffhausen Steamboat Company runs a service on the Upper Rhine, in the summer season only.

The development of the traffic is interesting. In 1865, as stated above, the passengers carried numbered 444,430. In 1885 there were 646,088 and in 1895 there were 1,113,338. Ten years later the figure had risen to 1,570,181. Then the war and the economic crises in the various Continental countries caused considerable fluctuations; however, in 1929 the boats carried 2,240,000 passengers. Competition from the privately owned motor boats and other causes led to a decline, the figure for 1931 dropped to 1,673,174, receipts falling in an even greater proportion. Local traffic today is comparatively poor, although it is fairly constant during the winter. The peak comes, of course, about August, but so much of the traffic being of the pleasure variety, the weather necessarily proves an important factor.

The average speed of the vessels is now about 20 kilometres per hour. The necessity for some generally accepted navigation and signal regulations, or Rule of the Road, was early felt, and in 1867 the governments concerned held a conference and reached an agreement on some questions. The first real Rule of the Road did not appear, however, until 1882. This has been revised many times since then and is now once more under review. Old harbour rights were given up in the course of time, and the lake was made free to all, each State performing the police and Customs duties in its own area. The boats themselves have passed through many changes from the days of the low pressure boilers and engines. Various kinds of the latter have been used, such as side lever, oscillating and diagonal. The compound system was introduced in 1875 and, in due course, feathering paddle wheels. Steam heating appeared in 1870 and in 1887 electric lighting was introduced.

Up till quite recently paddle wheel vessels were used exclusively, chiefly on account of the low draught of water available at some of the landing stages, but also because a change would have meant an alteration in the arrangement of the accommodation on the vessels, to which the public was accustomed. The oldest paddle steamer now in service is the *Greif*, built in 1887. The newest is the *Stadt Überlingen*, put into service in 1929 and representing the latest practice with this kind of boat. Several vessels fitted with motor engines and screw or other propellers are now in use. The twin-screw boat *Allgäu*, stationed at Lindau, which was put to work in the same year as the *Stadt Überlingen*, carries 1,200 passengers. In 1928 the Austrian Federal Railways put on a fine twin-screw diesel boat, the *Österreich*, which is not as long as the *Allgäu* and carries only 709 passengers. Such large vessels are not required in the winter months, and to replace some of the oldest paddle boats, the German State Railway ordered some smaller motor driven vessels, the *Kempten* and *Augsburg*, each having accommodation for 400 passengers. In 1931 another boat of this kind, the *Ravensburg*, was put on the lake, and in 1932 the Swiss railways introduced a twin-screw diesel boat called the *Thurgau*, with a carrying capacity of 450 passengers and soon afterwards ordered a sister vessel. There are in all now 31 vessels in the passenger services, or two fewer than in 1905.

The goods traffic, of which there is a good deal, is carried by means of motor-driven train ferries or on train barges, so that the wagons can be taken direct through to their destinations. The train barges are towed by the ferries or the passenger vessels. Repair yards and slips for dealing with the boats are provided by the three railway administrations; those of the German State Railway are at Lindau and Constance. At Constance there is an extensive harbour enclosed by breakwaters, where in 1929 some 10,920 arrivals and departures were made and 950,000 passengers were dealt with, which gives some idea of the importance of the steamer services to the connecting railway routes.

Exports of Railway Material from the U.K. in Sept.

	Sept., 1934	Sept., 1933	Nine Months Ending Sept., 1934	Nine Months Ending Sept., 1933
	£	£	£	£
Locomotives, rail	14,408	15,726	209,027	708,500
Carriages and wagons	154,773	31,679	638,767	358,364
Rails, steel	110,849	42,787	817,250	414,274
Wheels, sleepers, fishplates and miscellaneous materials	161,299	56,906	875,065	558,645

Locomotive and rail exports included the following :—

	Locomotives		Rails	
	Sept., 1934	Sept., 1933	Sept., 1934	Sept., 1933
	£	£	£	£
Argentina	—	5,036	6,466	8,834
Union of South Africa	—	4,060	37,098	4,550
British India	—	—	46,139	13,566

THE WEEK'S ROAD ACCIDENTS.—The Ministry of Transport return for the week ended October 13 of persons killed or injured in road accidents is as follows :—

	Killed	Deaths resulting from previous accidents	Injured
England	87 (94)	31 (35)	3,957 (4,139)
Wales ...	— (4)	3 (3)	145 (161)
Scotland	9 (6)	1 (2)	364 (406)
	96 (104)	35 (40)	4,466 (4,706)

The total fatalities of the week, as the result of road accidents, were therefore, 131, as compared with 144 for the previous week.

STRATFORD AND MORETON TRAMROAD —This ancient tramroad, the property of the G.W.R., had a section between Stratford-on-Avon and Ilmington, now abandoned, which ran alongside the main road for a considerable distance ; there are still some G.W.R. boundary marks in position. At the present time the County Council is widening the bridge over the River Stour and has dug away a part of the embankment there, in the course of which work many old stone sleepers have come to light.

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and passenger traffic figures for June, 1934, as compared with the corresponding period in 1933, compiled from the Ministry of Transport Statement No. 175.

Description	Great Britain *	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	103,326,955	8,055,911	16,287,920	25,873,884	18,416,747
Increase (+) or decrease (—)	+ 497,794	— 486,245	— 634,896	— 326,159	— 142,121
Passenger receipts (excluding season-ticket holders)	£4,696,859	£633,871	£945,820	£1,554,776	£1,027,249
Increase (+) or decrease (—)	— £295,203	— £63,197	— £74,370	— £135,377	— £30,340
Season-ticket receipts	£673,823	£42,372	£119,619	£188,013	£213,203
Increase (+) or decrease (—)	+ £8,565	— £317	— £3,085	+ £565	— £1,372
Parcels and miscellaneous traffic receipts (excluding parcels post)	£1,086,165	£184,585	£317,748	£403,793	£150,272
Increase (+) or decrease (—)	— £17,957	— £3,982	— £4,178	+ £4,398	— £2,005
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	19,244,825	4,651,761	8,720,867	8,642,706	1,165,814
Increase (+) or decrease (—)	+ 1,922,693	+ 205,453	+ 1,054,195	+ 871,038	— 69,174
Net ton-miles (excluding free-hauled)	1,064,198,438	201,179,705	362,084,654	422,350,427	50,325,676
Increase (+) or decrease (—)	+ 110,487,744	+ 18,966,726	+ 45,328,955	+ 40,337,445	+ 3,982,582
Average length of haul (miles) (excluding free-hauled)	55·30	43·25	41·52	48·87	43·17
Increase (+) or decrease (—)	— 0·24	+ 2·27	+ 0·20	+ 0·28	+ 1·24
Freight traffic receipts	£5,933,580	£1,041,000	£1,901,500	£2,437,000	£353,000
Increase (+) or decrease (—)	+ £320,437	+ £24,200	+ £126,000	— £145,000	+ £20,194
Receipts per ton-mile	1·338d.	1·24d.	1·26d.	1·33d.	1·68d.
Increase (+) or decrease (—)	— 0·075d.	— 0·10d.	— 0·09d.	— 0·06d.	— 0·04d.
Freight train-loads—					
Average train-load (tons)	120·11	128·08	126·57	115·95	101·77
Increase (+) or decrease (—)	+ 5·25	+ 6·23	+ 5·36	— 4·52	+ 5·62
Net ton-miles—					
Per train engine-hour	1,015·36	1,085·12	1,057·87	985·73	842·34
Increase (+) or decrease (—)	+ 28·77	+ 52·51	+ 34·00	— 6·47	+ 49·02
Per shunting-hour	828·48	767·77	898·74	859·93	559·87
Per total engine-hour	456·22	449·63	488·92	459·27	336·33
Net ton-miles per route-mile per working day	2,436	2,461	2,630	2,797	1,109
Increase (+) or decrease (—)	— 241	+ 212	+ 316	— 252	+ 101
Wagon-miles. Total	316,252,503	57,860,815	110,036,614	129,953,227	16,308,776
Increase (+) or decrease (—)	+ 22,498,084	+ 3,737,664	+ 9,646,534	+ 8,334,376	+ 786,015
Percentage of loaded to total	67·15	68·98	63·80	69·18	67·81
Wagons per train—					
Total	33·56	34·11	34·32	33·20	31·28
Increase (+) or decrease (—)	— 0·50	+ 0·79	+ 0·37	+ 0·50	+ 0·29
Loaded	22·54	23·53	21·90	22·97	21·21
Empty	11·02	10·58	12·42	10·23	10·07
Train-miles. Coaching—					
Per train-hour	15·16	13·99	14·24	14·69	17·65
Per engine-hour	12·02	11·05	11·05	11·08	14·26
Train-miles. Freight—					
Per train-hour	9·93	10·25	9·77	9·96	10·04
Per engine-hour	3·80	3·53	3·89	3·92	3·24
Engine miles. Total	44,872,413	6,996,516	12,274,402	16,654,790	6,079,770
Increase (+) or decrease (—)	— 1,673,266	— 199,970	+ 578,301	— 812,459	— 61,415
Mileage run by engines. Total train-miles—					
Coaching	23,328,366	3,141,441	5,356,187	7,704,388	4,472,090
Freight	9,422,379	1,696,451	3,208,391	3,914,021	524,241
Engine-hours in traffic. Total	4,623,398	788,629	1,376,895	1,770,180	493,442
Increase (+) or decrease (—)	+ 187,312	+ 18,557	+ 70,287	— 93,970	— 4,443
Shunting miles per 100 train-miles—					
Coaching	7·43	6·94	6·38	8·18	8·19
Freight	72·50	83·01	69·19	66·94	93·78

* All standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and receipts per journey (excluding Season-Ticket Holders)—June, 1934

Subject	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	29,265,100	704,217	1,192,913	1,718,844	2,909,344	21,845	146,138	21,688,884	84,732
Gross receipts	£928,995	£86,020	£128,998	£147,817	£237,957	£3,159	£1,568	£305,818	£1,561
Receipts per passenger journey	7·62d.	29·32d.	25·95d.	20·64d.	19·63d.	34·71d.	2·58d.	3·38d.	4·42d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	43,210,383	4,902,375	10,182,382	15,645,188	8,993,246	436,270	173,291	1,205,132	627,420
Gross receipts	£3,002,092	£457,776	£672,043	£1,168,454	£596,044	£31,317	£1,876	£27,904	£10,027
Receipts per passenger journey	16·67d.	22·41d.	15·84d.	17·92d.	15·91d.	17·23d.	2·60d.	5·56d.	3·84d.
Workmen—									
Passenger journeys	24,535,481	1,742,754	3,263,239	6,528,050	5,245,050	230,272	180,236	6,282,448	187,020
Gross receipts	£354,094	£25,710	£52,089	£104,081	£85,710	£4,047	£1,466	£68,888	£1,713
Receipts per passenger journey	3·46d.	3·54d.	3·83d.	3·83d.	3·92d.	4·22d.	1·95d.	2·63d.	2·20d.
Other descriptions—									
Passenger journeys	6,272,472	697,217	1,637,499	1,968,138	1,266,797	80,688	788	489,044	17,661
Gross receipts	£358,782	£51,456	£79,910	£110,485	£104,617	£3,909	£5	£4,929	£212
Receipts per passenger journey	13·73d.	17·71d.	11·71d.	13·47d.	19·82d.	11·63d.	1·52d.	2·42d.	2·88d.
Total—									
Passenger journeys	103,326,955	8,055,911	16,287,920	25,879,884	18,416,747	769,259	500,453	29,665,508	916,833
Gross receipts	£4,696,859	£633,871	£945,820	£1,554,776	£1,027,249	£42,652	£4,915	£407,539	£13,513
Receipts per passenger journey	10·91d.	18·88d.	13·94d.	14·42d.	13·39d.	13·31d.	2·36d.	3·30d.	3·54d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

NOTES AND NEWS

New L.M.S. & G.W.R. Halt on Shrewsbury Welshpool Line.—A new passenger halt is to be erected by the L.M.S. and G.W. Railways at Plas-y-Court, between Breidden and Westbury stations on the Shrewsbury-Welshpool joint line. The halt will be served by the existing train service.

Irish Wages.—Railway shopmen in the running sheds of the Great Southern Railways at Broadstones and Grand Canal Street, Dublin, have been granted increases of 2s. 6d. a week, following application by the National Union of Railwaymen. These increases do not affect the general application of the unions for the restoration of the 10 per cent. reduction in shopmen's wages made in 1929.

The Distant Signal Problem.—At the Institution of Railway Signal Engineers on Wednesday, October 10, a discussion, without a formal paper, on this subject was initiated by Mr. T. S. Lascelles. Among the subsequent speakers were Messrs. C. Carslake, W. Challis, A. W. Woodbridge, E. H. Peter, B. F. Wagenrieder, A. G. T. Wilding, C. W. Prescott, M. H. White, and M. G. Tweedie. A leading article on page 615 deals with the subject.

Cheap Tickets for the Royal Wedding.—Cheap railway fares to London have been arranged for November 29, the wedding day of the Duke of Kent and Princess Marina. The main line railways have decided to issue tickets to London at cheap fares from all stations which have cheap fare bookings on early closing days or regular cheap ticket days. These tickets will be available by any train.

Trial Trip on Moscow Underground.—A Reuters message from Moscow states that the first train to run on the new Moscow underground railway made a trial trip of 1½ miles on Tuesday evening, October 16. It is reported that the track proved to be entirely satisfactory and all passed off without hitch. The Moscow Underground Railway is fully described in the *Electric Railway Traction Supplement* which accompanies this issue of THE RAILWAY GAZETTE.

The Chinese Eastern Railway Sale.—A press message from Tokyo states that M. Kuznetsoff, Deputy General Manager of the Chinese Eastern Railway, has arrived in Tokyo to interview M. Hirota, Japanese Foreign Minister. It is understood that the negotiations for the sale of the Chinese Eastern Railway will now come to a speedy conclusion. Only questions of guarantee and the time of handing over remain to be settled. It is understood in Japanese circles, a subsequent message adds, that machinery, electrical apparatus, rice, wheat, paper, and other miscellaneous goods have been selected by Soviet Russia for the Yen 100,000,000 (approximately £5,900,000) payment in kind which is to be received as part of the purchase price of the railway, now called the North Manchuria Railway.

French Electrification Orders.—In connection with the conversion of the Paris-Le Mans main line, the French State Railways Administration is understood to have ordered 28 express electric locomotives of the 2-Do-2 type which will have a rated output of 4,000 h.p.

Southern Railway Cross-Channel Motor Car Ferry.—The Southern Railway Company's motor car ferry boat *Autocarrier* will continue to run between Dover and Boulogne on its present timetable up to, and including, Wednesday, October 31. After that day, the services during the winter months will be diverted to the Folkestone-Boulogne route, thus shortening the land part of the journey to Paris. It will then leave Folkestone at 10.30 a.m. and Boulogne Maritime at 12.30 p.m.

London Tube Line Renamed.—The former Great Northern & City section of the Metropolitan Railway, extending from Finsbury Park to Moorgate, has been renamed by London Transport the Northern City Line. The name was first displayed on a new poster diagram of the central area Underground routes and interchange points. Work is in active progress which will knit the Moorgate terminal of the Northern City Line to the adjacent City Line station. A diagram showing the general arrangement of this linking-up scheme appeared on page 781 of THE RAILWAY GAZETTE of May 4 last.

Mr. Bywell's Broadcast from York.—A new feature introduced by the B.B.C. on October 12—an aerial cruise over North Regional radio routes in the four-engined transmitter "Moorside Edge"—was remarkable for the fact that when York was reached listeners were introduced to Mr. E. M. Bywell, curator of the local Railway Museum, who gave a brief but impressive account of the many interesting exhibits under his charge there. The talk was heard with great clearness, and was, doubtless, much appreciated by many in the railway world who have come in contact with Mr. Bywell. It may be recalled that he gave a highly interesting broadcast from the Railway Centenary Exhibition at Darlington in the summer of 1925.

Canadian Railway Amalgamation Opposed.—A Reuters message from Halifax quotes Mr. C. P. Fullerton, Chairman of the Board of Trustees, Canadian National Railways, as saying to a meeting of business men on Wednesday: "The amalgamation of Canada's two great railway systems, the Canadian National and the Canadian Pacific would not be in the interests of Canada." Departing from the policy of silence which he has hitherto observed, Mr. Fullerton contended that Mr. E. W. Beatty, the Chairman and President of the Canadian Pacific Railway, who favours amalgamation, was wrong in his claim that amalgamation was the solution of the problem of uneconomic running. "All that could be saved by amalgamation," he added, "can be saved by co-ordination if the railways honestly co-ordinate their efforts."

New Snow Ploughs for L.M.S.R.—Twenty-four new engine snow ploughs for use on mountainous and exposed sections of the system are to be provided by the L.M.S.R., largely in replacement of obsolete existing equipment. For service in Scotland 15 new snow ploughs of the "all-steel-nose" type will be introduced, and will be used to a large extent on the Highland section between Perth, Inverness, and the far north. Nine other snow ploughs are to be provided for service in England and Wales, comprising four for the Carlisle-Hellifield line, four for the South Wales area, and one for Buxton, Derbyshire.

Northern Ireland Line Re-opened.—The Great Northern Railway (Ireland) re-opened for passenger traffic its Banbridge-Scarva line on Monday, October 15. The normal traffic is provided by a railcar which stops to pick up or set down passengers at the various crossings and halts *en route*. In addition, a service by steam trains is being given on Saturdays. The railcar also provides an additional service between Scarva and Newry. The new service links Banbridge with the main Dublin-Belfast line of the G.N.R. (I.) at Scarva junction, and thus provides not only local facilities but also makes good connections for Belfast, Dublin, Newry, Warrenpoint, Newcastle and intermediate places. The bus service between Banbridge and Goraghwood is being discontinued.

Exhibition of Rolling Stock at York.—Some 20,000 persons attended the exhibition of L.N.E.R. rolling stock which was held at York on Sunday last, October 14. The exhibition was opened by the Lord Mayor of York (Councillor H. E. Harrowell). Major W. H. Carver, M.P., a Director of the L.N.E.R., presided, and Mr. Thomas Hornsby, Divisional General Manager, North Eastern Area, L.N.E.R., proposed a vote of thanks. Among those present were :—

General Sir Alex. E. Wardrop, K.C.B., C.M.G., General Officer Commanding Northern Command; The Lady Mayoress; The Sheriff of York (Mr. A. L. Creer) and his Lady; Mrs. Thomas Hornsby; Mr. E. R. Turton, M.P.; Col. L. Ropner, M.P.; and the following officers of the North Eastern area, L.N.E.R.: Mr. C. M. Jenkin Jones, Superintendent; Mr. S. T. Burgoyne, Passenger Manager; Dr. J. G. McBride, Medical Officer; Messrs. C. M. Stedman, Locomotive Running Superintendent; F. H. Graveson, Assistant to Divisional General Manager; W. H. Brown, Carriage Works Manager; A. S. Pearson, Assistant to Goods Manager; T. H. Royle, District Superintendent, York; A. Cameron, District Engineer, York; A. E. Tattersall, Signal and Telegraph Engineer; H. S. Cole, Chief of Police; J. J. Lovatt, Assistant Locomotive Running Superintendent; and many other railway officials together with civic and hospital officials.

The exhibits included the *Flying Scotsman* locomotive, No. 10000, and *Earl*

Marischal, a new engine of the "Cock o' the North" type which came direct from the Doncaster works to the exhibition. There were also electric and Sentinel locomotives, Post Office coaches, a breakdown crane, velocipedes, special wagons and platelayers' trollies, camping, buffet, sleeping, and restaurant cars, and the Dictaphone equipment which is installed on a King's Cross-Newcastle express. The exhibition was held in aid of the York County Hospital building fund.

Polish Railcar Policy.—A Reuters message states that the Polish State Railways have embarked upon a scheme for replacing steam trains by high-speed railcars on many main and branch line services. It is forecast that, under this plan, all steam day expresses will be replaced by railcars by May, 1936.

Alcoy & Gandia Railway.—We understand that Mr. Patrick L. Fleming, of Dashwood House, 69, Old Broad Street, E.C.2, has been appointed receiver and manager of the Alcoy & Gandia Railway and Harbour Company's property (other than railway undertaking), by Order of Court dated October 12, 1934. The Order was obtained by the Governments Stock & Other Securities Investment Co. Ltd., of Dashwood House, E.C.2.

Mineowners and Railway Property.—Mr. Justice Farwell gave judgment on October 16, in the Chancery Division, for the London & North Eastern Railway Company in its claim against the Hardwick Colliery Co. Ltd. for a contribution towards expenses incurred in making good damage caused to the railway by mineral workings. The decision turned on the construction of Section 85 (*b*) 2 of the Mines (Working Facilities and Support), Act 1923. Though the defendants had acquired mineral rights under the area in question before the railway company acquired the surface, the defendants had surrendered their earlier leases and taken fresh leases since 1923, which took them out of the protection which they might otherwise have had under the Section.

Photo-Cell Controlled Warning at Earls Court.—Photo-cell equipment, supplied by the General Electric Co. Ltd., has just been installed at Earls Court underground station, London Transport, to warn passengers when the lift gates are about to close. This apparatus operates in the same way as a cinema sound projector. A band of film on which are recorded the words "stand clear of the gates please," is arranged to pass across the light from a lamp; the beam is concentrated by a suitable optical system on to an Osram photo-cell. The photo-cell is associated with an amplifier of conventional design with a moving-coil speaker. Passengers approaching the gates therefore hear the warning; at the same time a sign "gates closing" is illuminated. Such equipment enables the services of the lift attendant to be dispensed with and the whole operation of the lift rendered completely automatic. We have previously referred to the use by the London Passenger Transport Board of photo-cell control of escalator speeds, and of the platform warning lights where a curved track leaves a space between the platform edge and the train.

Cheaper Travel to the Riviera.—With reference to the paragraph under the above heading, published in last week's issue, to clear up any misconception that may have arisen, it should be pointed out that this referred to an extension of the 30-day return tickets from London to the Riviera, and not to a still further reduction. The special 30-day return tickets at about a single fare and a third, introduced last summer, will be on issue throughout the winter and until further notice. They are available for travel from London by any service on Mondays or Saturdays only, and may be used for return on any day within the validity of the ticket. Holders can also obtain a 25 per cent. reduction in Wagons-lits and Pullman supplements in France, provided the accommodation in each direction is booked and paid for in advance.

Railway Conciliation Machinery.—Representatives of the four group railway companies met in London on Tuesday representatives of the National Union of Railwaymen, the Railway Clerks' Association, and the Associated Society of Locomotive Engineers and Firemen, and further discussed the question of machinery of negotiation for railway staff. The trade union representatives are reporting to their executive committees. Those present included:—Sir James Milne, G.W.R., in the chair; Sir H. A. Walker, Southern Railway; Sir R. L. Wedgwood, L.N.E.R.; Mr. W. V. Wood, L.M.S.R.; Mr. Kenelm Kerr, Chairman, and Mr. F. Gilbert, Secretary, Railways Staff Conference, all representing the railway companies; Mr. J. Marchbank and Mr. J. Henderson, representing the N.U.R.; Mr. G. Lathan and Mr. F. B. Simpson, representing the R.C.A.; Mr. W. J. R. Squance, and Mr. G. H. Tyler, representing the A.S.L.E.F.

Swainsley Viaduct, L.M.S.R.: Progress and a Discovery.—In the issue of THE RAILWAY GAZETTE dated July 13 last, the reconstruction of Swainsley, Belper Pool, and Broadholme viaducts on the Derby-Ambergate section of the old Midland Manchester main line of the L.M.S.R., was described and illustrated. At that time the work at Broadholme was virtually finished, and that at Belper Pool was subsequently completed about the end of August. At Swainsley viaduct however, the contractor's temporary bridge and staging were only then being completed and work on the cylinders had just begun. The reconstruction has now proceeded so satisfactorily that it is nearing completion. In carrying it out the engineers, with the aid of a diver, made an interesting discovery, in the shape of a number of timber piles which were imbedded to a depth of 8 ft. to 10 ft. in the river bed. These were evidently part of the foundations of the original timber bridge built in 1840 for the North Midland Railway, of which George Stephenson was the supervising engineer; his constructional engineer for this viaduct was Frederick Swanwick. Despite their 94 years' immersion in the River Derwent, these timbers were in an excellent state of preservation.

Ransome & Marles Bearing Co. Ltd.—At the annual general meeting of this company on October 12, the Chairman (Mr. V. S. Woods) called attention to the steady increase in the demand for the company's products during the period covered by the accounts. The use of ball and roller bearings continued to expand, and there was scarcely any branch of production or industry in any part of the world which was not an actual or potential customer. To enable the company's manufacturing efficiency to be improved constantly, large additions were being made to the plant, and in the year under review £40,195 had been expended in this direction. Colonel Higgs, in seconding the adoption of the report, explained that the increase in the company's export business was being very well maintained in spite of the difficulties of currency restriction and exchange. The company's bearings had a reputation in so many markets abroad that they were used where important and particular applications of ball and roller bearings demanded an article which would stand up to the most exacting conditions.

Road Goods Transport Conciliation Board.—A joint meeting of road transport employers and representatives of the Transport and General Workers' Union, held at the Ministry of Transport, has unanimously adopted a resolution setting up a Joint Conciliation Board for the Metropolitan Traffic Area for Road Transport (Goods), consisting of twelve representatives—six employers and six workpeople. It also adopted a constitution. Mr. J. H. Turner (an employers' representative) was unanimously elected chairman; Mr. C. Coxsedge (workpeople) Vice-Chairman, and Mr. R. P. Bailey and Mr. F. G. Witcher Joint Secretaries. It was agreed that a further meeting should be held in a week's time for the purpose of considering important matters connected with the industry. The employers' bodies represented at the meeting were the Motor Transport Employers' Federation, the London and Home Counties Haulage Contractors' Association, and the Road Haulage Association. Among the functions of the area conciliation boards proposed by the sub-committee of the National Board in August were to be the negotiating body for local matters and to consider any differences that cannot be settled between parties in dispute.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 41st Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941¼ mls.)	£	£	£	£	£	£
Passenger-train traffic...	449,000	438,000	+ 11,000	20,034,000	19,719,000	+ 315,000
Merchandise, &c. ...	480,000	464,000	+ 16,000	18,135,000	16,849,000	+1,286,000
Coal and coke ...	221,000	215,000	+ 6,000	9,139,000	8,728,000	+ 411,000
Goods-train traffic ...	701,000	679,000	+ 22,000	27,274,000	25,577,000	+1,697,000
Total receipts	1,150,000	1,117,000	+ 33,000	47,308,000	45,296,000	+2,012,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	292,000	284,000	+ 8,000	12,935,000	12,711,000	+ 224,000
Merchandise, &c. ...	352,000	328,000	+ 24,000	12,651,000	11,693,000	+ 958,000
Coal and coke ...	231,000	231,000	—	9,218,000	8,440,000	+ 778,000
Goods-train traffic ...	583,000	559,000	+ 24,000	21,869,000	20,133,000	+1,736,000
Total receipts	875,000	843,000	+ 32,000	34,804,000	32,844,000	+1,960,000
G.W.R. (3,750¾ mls.)						
Passenger-train traffic...	183,000	179,000	+ 4,000	8,487,000	8,488,000	— 1,000
Merchandise, &c. ...	197,000	183,000	+ 14,000	7,318,000	6,843,000	+ 475,000
Coal and coke ...	95,000	95,000	—	4,040,000	3,946,000	+ 94,000
Goods-train traffic ...	292,000	278,000	+ 14,000	11,358,000	10,789,000	+ 569,000
Total receipts	475,000	457,000	+ 18,000	19,845,000	19,277,000	+ 568,000
S.R. (2,176 mls.)						
Passenger-train traffic...	264,000	257,000	+ 7,000	12,266,000	12,081,000	+ 185,000
Merchandise, &c. ...	65,500	66,000	— 500	2,595,500	2,489,500	+ 106,000
Coal and coke ...	28,500	28,000	+ 500	1,255,500	1,183,500	+ 72,000
Goods-train traffic ...	94,000	94,000	—	3,851,000	3,673,000	+ 178,000
Total receipts	358,000	351,000	+ 7,000	16,117,000	15,754,000	+ 363,000
Liverpool Overhead ... (6½ mls.)	1,062	1,109	— 47	47,031	46,640	+ 391
Mersey (4½ mls.) ...	4,067	4,083	— 16	166,241	162,658	+ 3,583
*London Passenger Transport Board ...	546,300	532,400	+ 13,900	7,946,200	7,852,500	+ 93,700
IRELAND.						
Belfast & C.D. pass. (80 mls.)	1,918	1,912	+ 6	107,135	108,931	— 1,796
,, ,, goods	558	471	+ 87	20,965	21,130	— 165
,, ,, total	2,476	2,383	+ 93	128,100	130,061	— 1,961
Great Northern pass. (562 mls.)	8,650	7,850	+ 800	418,250	321,750	+ 96,500
,, ,, goods	9,550	9,500	+ 50	343,150	269,350	+ 73,800
,, ,, total	18,200	17,350	+ 850	761,400	591,100	+ 170,300
Great Southern pass. (2,158 mls.)	20,235	20,485	— 250	1,008,489	997,728	+ 10,761
,, ,, goods	36,699	35,988	+ 711	1,319,714	1,239,268	+ 80,446
,, ,, total	56,934	56,473	+ 461	2,328,203	2,236,996	+ 91,207

* 15th week the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

RAILWAY AND OTHER REPORTS

Bengal Dooars Railway.—The directors recommend a final dividend of 4 per cent. on the ordinary stock, making 7 per cent. for the year ended March 31, 1934, the same as for the previous year.

Madras & Southern Mahratta Railway.—The directors have decided to recommend at the meeting on December 5 a dividend for the half-year ending December 31, payable January 1, 1935, of £5 per cent., which will make, with £4 10s. per cent. paid in July, a total of £9 10s. per cent. for the year, as against £9 per cent. paid last year.

Buenos Ayres Western Railway.—The directors announce that although the net revenue for the year ended June 30, 1934, is less than for the previous year, by drawing on the balance accumulated in former years and by the sale of Government bonds in Buenos Aires, and remitting the proceeds through the free exchange market, they are enabled to authorise the payment of dividends for the year on the company's 4½ and 5 per cent. preference stocks on November 17, 1934. The directors regret that it is not possible to recommend any dividend on the ordinary stock.

Buenos Ayres Great Southern Railway.—The directors announce that although the net revenue for the year ending June 30, 1934 is less than for the previous year, by drawing on the balance accumulated in former years, and by the sale of Government bonds in Buenos Aires and remitting the proceeds through the free exchange market, they are enabled to authorise the payment of dividends for the year on the company's 5 and 6 per cent. preference stocks on November 17. The directors regret that it is not possible to recommend any dividend on the ordinary stock.

Central Argentine Railway—The directors announce that no payment is being made for the year ended June 30, 1934, on either the 4½ per cent. or 6 per cent. preference stocks.

British and Irish Railways Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices Oct. 17, 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	31	54	+½
5% Con. Prefce. ...	109¾	69½	112	—
5%Red.Pref.(1950)	109¼	87½	109½	—
4% Deb.	108 15/16	99¼	109½	—
4½% Deb.... ...	108	100¾	111½	—
4½% Deb.... ...	116	106	119½	—
5% Deb.	128	117¼	130	—
2½% Deb.... ...	65	60	70½	—
5% Rt. Charge ...	124	111½	128½	—
5% Cons. Guar. ...	122	103	126	—
L.M.S.R.				
Ord.	29⅞	12⅛	22	—
4% Prefce. (1923)	51	17	51½	−½
4% Prefce. ...	72	33¼	81	—
5%Red. Prf. (1955)	93	47¼	100½	—
4% Deb.	103¼	89½	105½	+½
5%Red.Deb.(1952)	114	105	115½	—
4% Guar.	97¼	68⅜	101	—
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	16¾	—
Def. Ord.	10¾	4⅛	8	−⅛
4% First Prefce. ...	65½	19⅜	68	—
4% Second Prefce.	40½	12¼	32½	−½
5%Red.Pref.(1955)	83¾	27	87½	+1
4% First Guar. ...	94⅜	58¼	97	+½
4% Second Guar.	89¼	48	91	+½
3% Deb.	77	60¼	79	—
4% Deb.	102¾	80	103½	+½
5%Red.Deb.(1947)	112	102½	111	—
4½% Sinking Fund Red. Deb.	107½	98¾	108½	—
SOUTHERN				
Pref. Ord.... ...	71	27¾	74	—
Def. Ord.	24⅝	9⅜	22	−½
5% Prefce. ...	107 11/16	74	112	—
5%Red.Pref.(1964)	107¾	78⅞	111½	—
5% Guar. Prefce.	124¼	102¾	125½	—
5%Red.Guar.Pref. (1957)	115⅝	103½	115	—
4% Deb.	107½	96¾	109	—
5% Deb.	126½	114¼	129½	—
4% Red. Deb. 1962–67	107¼	100	109½	—
BELFAST & C.D.				
Ord.	6		5	—
FORTH BRIDGE				
4% Deb.	99½	95½	102½	—
4% Guar. ...	98½	94	102½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	7	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	14	—
Prefce.	24	12⅛	16½	—
Guar.	42	16¾	43½	−2½
Deb.	60	30⅞	60½	—
L.P.T.B.				
4½% "A" ...	117⅞	112	121½	—
5% "A"	127¼	119¼	131½	—
4½% "T.F.A." ...	111¼	106	112	+½
5% "B"	122½	114	125½	—
"C"	86¾	74½	86½	+½
MERSEY				
Ord.	16¼	5	9	
4% Perp. Deb. ...	83	63⅞	86½	—
3% Perp. Deb. ...	62	51	64½	—
3% Perp. Prefce....	50⅝	27	46½	—

CONTRACTS AND TENDERS

John Baker & Bessemer Limited has received an order from the Buenos Ayres Western Railway for 309 locomotive tyres and 11 locomotive axles.

United Water Softeners Limited has received an order from the Buenos Ayres Western Railway for five Zerolit water softening plants.

Craven's Railway Carriage & Wagon Co. Ltd. has received an order from the Buenos Ayres Great Southern Railway for a quantity of carriage and wagon details, consisting of drawgear parts in special steel.

Worthington-Simpson Limited has received an order from the Trans-Zambesia Railway for a 5¼-in. × 18-in. vertical bucket and foot-valve pump with 8-h.p. Petter heavy-oil engine.

Locomotive Boilers for Nigeria

Robert Stephenson & Co. Ltd. has received an order from the Crown Agents for the Colonies for three boilers for "301" class locomotives, Nigerian Government Railways.

Thos. Firth & John Brown Limited has received an order from the South Indian Railway for 50 broad-gauge carriage and wagon axles, to the inspection of the consulting engineers, Messrs. Robt. White & Partners.

The Economical Boiler Washing Co. Ltd. has received an order from the Eastern Bengal Railway for two hot water boiler washing plants. These are of the single-tank double-pump type, and are for the sheds at Katihar and Lalmonhirhat.

The East Indian Railway Administration has placed orders for permanent way materials as follow :—

Henry Williams, India (1931) Limited : 250,000 m.s. tiebars for cast iron sleepers, and 400,000 m.s. jaws for cast iron sleepers. (75 lb. D.H. or 85 lb. B.H. rails will be supplied by the Railway Administration for conversion).

The Hooghly Docking and Engineering Company : 400,000 m.s. cotters for cast iron sleepers.

The Premier Steel Tube Co. Ltd. has received orders from the South Indian Railway for 650 5¼ in. diam. × 12 ft. 1 in. long, 3,300 1¾ in. diam. × 9 ft. 9½ in. long and 4,500 2 in. diam. × 12 ft. long solid drawn steel boiler tubes, to be supplied to the inspection of the consulting engineers, Messrs. Robt. White & Partners.

Hurst, Nelson & Co. Ltd. has secured orders for two four-wheeled bogies, two bogie open wagons and two bogie platform wagons for the 2 ft.-gauge lines of the Mysore State Railways and for three metre-gauge bogie carriage underframes complete with wheels and axles and electrical equipment for the same Administration, all to the inspection of the consulting engineers, Messrs. Rendel, Palmer & Tritton.

Sir W. G. Armstrong Whitworth & Co. (Engineers) Limited has received an order from the Crown Agents for the Colonies for a 15-ton diesel-electric shunting locomotive for the metre gauge lines of the Penang Harbour Board.

Killick Nixon & Co., on behalf of the Kumardhubi Engineering Works Limited, has secured an order from the Great Indian Peninsula Railway for 47 front castings at Rs. 115,13,3 each and 47 back castings at Rs. 133,4,0 each for driving axlebox guide stays for XA/1 and XA/2 locomotives.

British Wagons ordered for China

The Metropolitan-Cammell Carriage Wagon & Finance Co. Ltd. has received an order from the Chinese Government Purchasing Commission on behalf of the Ministry of Railways, China, for ten 40-ton all-steel bogie covered goods wagons required for service on the Chu-Shao section of the Canton-Hankow Railway. These wagons are to be of the same type as fifty which the Metropolitan-Cammell Carriage Wagon & Finance Co. Ltd. recently supplied to the order of the Chinese Government Purchasing Commission for the same line, and are to be constructed under the inspection of the consulting engineers, Messrs. Fox & Mayo.

G. R. Turner Limited has received an order from the Chinese Government Purchasing Commission, on behalf of the Ministry of Railways, China, for 25 all-steel high sided 40-ton wagons, to be supplied to the inspection of the consulting engineers, Messrs. Fox & Mayo.

The Chinese Government Purchasing Commission, on behalf of the Ministry of Railways, China, has also placed the following orders for equipment, to be supplied to the inspection of Messrs. Fox and Mayo :—

Horseley Bridge and Thos. Piggott Limited : Two steel water tanks of 30,000 gal. capacity with supporting steel work and two steel water tanks of 10,000 gal. capacity.

Norton & Gregory Limited : drawing instruments and linen tapes.

Morgan Crucible Company. 1 tilting furnace of 450 lbs. capacity.

John Walsh (Birmingham) & Co. Ltd. : 3,268 metric tons corrugated reinforcing steel bars.

The Egyptian State Railways Administration has placed the following orders :—

Stewarts & Lloyds Limited and the Power Flexible Tubing Co. Ltd. : Tubes and pipes.

Siemens Brothers & Co. Ltd. and British Insulated Cables Limited : Telephone materials.

N. V. Montan Export : Mild steel rounds.

Tenders are invited by the East Indian Railway, receivable at the Agents' office, 105, Clive Street, Calcutta, by October 30, for the supply of 2,000,000 liners for D. and O. cotters.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), invites tenders, receivable by November 8, for the supply of 15 vertical boilers suitable for a working pressure of 125 lb. per sq. in., complete, and receivable by November 14, for the supply of ball and roller bearings for the period February 1, 1935, to January 31, 1936.

The Egyptian State Railways Administration invites tenders, closing on November 20, for the supply of 150,000 metric tons of coal and, closing November 10, for 900/1,000 metric tons of foundry coke.

The Egyptian State Railways Administration also invites tenders receivable on the dates, where named, as follow :—

10-Ton all-steel box trucks (see this column, last week's issue). (January 2, 1935).
Supply of black hexagon nuts (November 24).
Supply of earthenware conduits (October 31).
Welding materials (November 7).
1,223–1,495 Metric tons rolling-stock oils (December 8).
10,000 Mild steel joists (November 14).
100 Sheets expanded metal steel.
310 Metres steel woven wires and 125 metres brass woven wire cloth.
27 Metric tons tin ingots (October 25).
5,000 Kilos. brass round bars.
600 Kilos. aluminium ingots.
64,000 Kilos. tin ingots (January 16, 1935).
5,500 Kilos. flat bars for laminated springs.
Portable petrol or paraffin engine coupled to two d.c. generators (November 1).
34 Engine and tender tyres, 4 ft. 6⅞ in. diam. and eight engine tyres 1 ft. 9⅝ in. diam.
135 Tyres for bogie wagon stock (November 29).
Signalling materials.
31 Metric tons of hard drawn copper wire (November 21).
100,000 Kilos. galvanised iron wire (November 28).
30,000 Kilos. galvanised iron wire.
Supply of high tension switchgear (November 6).
24 Weighing machines, 2,500 kilos., 1,000 kilos., 250 kilos., and 150 kilos. (December 1).

The Converted "Asturias"

A party of guests of Royal Mail Lines Limited, numbering nearly 350, travelled by special train from London to Southampton on Monday and embarked on the Royal Mail liner *Asturias* for a cruise in the Solent where, at speeds up to her service speed of 18 knots, favourable comment was made on the smooth running of the ship and the absence of vibration. With a view to increasing her speed without any increase in the size of machinery space, the original diesel engines of the *Asturias* have been replaced by single-reduction geared steam turbines with high-pressure Johnson boilers. A full technical description of the conversion of the *Asturias* from a motorship to a steamship was published in the October 11 issue of our associated contemporary *Shipbuilding and Shipping Record*. On Monday last Mr. Donald A. Mackinnon, Passenger Manager, Royal Mail Lines, presided at the luncheon on board in the absence of Mr. P. G. Mylne Mitchell, the Director and General Manager, who, Mr. Mackinnon explained, was dangerously ill. In proposing the health of the guests he emphasised that there was no desire on the part of the company to secure the Blue Riband of the South Atlantic. All it desired was to continue to live in friendly rivalry with its competitors some of whom he was pleased to say were at that gathering. There were no secrets about the machinery, which was open to inspection. The Mayor of Southampton, who replied, said that the company was to be congratulated on its enterprise and he felt sure that the expense would be fully justified. He joined in the expression of regret at the absence of Mr. Mylne Mitchell to whom credit was due for the decision to make the change of machinery.

OFFICIAL NOTICES

South Indian Railway Company Limited.

NOTICE IS HEREBY GIVEN that the next Ordinary General Meeting of the South Indian Railway Co. Ltd. will be held at the Offices of the Company, 91, Petty France, Westminster, S.W.1, on Wednesday, the 31st October, 1934, at 12 noon, for the purpose of receiving the Directors' Report and Statements of Accounts for the year ended 31st March, 1934, and for the transaction of the ordinary general business of the Company.

The Transfer Books will be closed from Monday, the 17th, to Monday, the 31st day of December, 1934, both days inclusive, for the preparation of the half-yearly Warrants.

Transfers will not be received at the Office while the Books remain closed.

The Warrants payable on and after the 1st January, 1935, will be forwarded to the Proprietors on the 31st December, 1934.

By Order,
(Sd.) A. MUIRHEAD,
Managing Director

Company's Offices :—
91, Petty France,
Westminster, S.W.1.
10th October, 1934.

PATENTS for Inventions, Trade Marks, Advice, Handbook, and consultations free. King's Patent Agency, Ltd. (B. T. King, C.I.M.E., Registered Patent Agent, G.B., U.S., and Canada), 146A, Queen Victoria Street, London, E.C.4. 49 years' references. 'Phone City 6161.

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Noise Insulation of Tube Stock

An experimental sound-proof tube railway coach is at present under construction at the Acton works of the London Passenger Transport Board and will be ready for preliminary trials in about six weeks. Numerous experiments have been carried out in the past, both in London and New York, with the object of abating the noise of underground railways, and especially tube lines.

Just over two years ago J. W. Roberts Limited, of Armley, near Leeds, sprayed with asbestos fibre a section of the tube tunnel between Hampstead and Golders Green, so as to lessen in the carriages the noise of the trains. For various reasons, prominent among which was cost, it was found impossible to extend the experiment, but the same asbestos noise-insulating lining is now being applied to the carriage itself.

This consists of spraying asbestos on the inside of the metal panels, which has been carried out by J. W. Roberts Limited. It has been found that asbestos applied in this manner is highly efficient in absorbing sound and also as a heat insulator. The thickness of the asbestos is ½ in., making a compact homogeneous felt which adheres strongly to the metal surfaces. It is applied on all the metal surfaces within the car, including ceilings and other interior panels. The underside of the steel floor is also treated, together with the interior of the rectangular boxes under the seats and over the bogie wheels.

The basis of the system is that, when asbestos is sprayed on to steel panels or other surfaces subject to vibration, the spongy flexible quality of the covering applied prevents the formation of sound waves. Similarly sound waves are not reflected from surfaces thus coated. Practical experiments and determinations made by the National Physical Laboratory showed sprayed asbestos to be the most efficient sound absorbing material yet discovered. Thick coverings give almost complete absorption at all frequencies, and normal thicknesses prevent the reflection of the major portion. Sprayed asbestos has a remarkably low thermal conductivity because of the high proportion of confined air cells. By covering all difficult sections in a way not possible with material in sheet form, the average thermal conductivity of a covered surface is further reduced.

It is applied by means of an air gun with two nozzles. The stream of asbestos fibres discharged from a nozzle is intersected by a spray of adhesive discharged simultaneously from a normal paint spraying gun. These thoroughly intermingle in mid-air before striking the surface to be coated and firmly adheres to this. The application is under complete control of the operator. The thickness, density, appearance and quality of the surface can be modified to suit, and uneven surfaces smoothed out. The adhesive discharged from the paint gun is controlled by a trigger so that the quantity of fibre can be regulated evenly from the machine and corresponding alterations to the quantity of adhesive made. The fibre stream can be started or cut off by turning a two-way air cock.

To make the noise insulation effective it is obviously necessary that all windows, doors, and other openings should be airtight while the train is in motion through a tube. The London Transport engineers have devised special means of ventilation for the experimental car now under construction at Acton works, but details of the installation are not so far available. In view of the local nature of the service for which London tube trains are destined, including frequent stops at stations, it is improbable that complete air conditioning will be adopted, and it seems likely that, whatever course is taken with the experimental car, the general equipment of London tube rolling stock would not extend beyond the provision of temperature adjustment and air cleansing.

Forthcoming Events

Oct. 19 (*Fri.*).—Institution of Mechanical Engineers, at Connaught Rooms, Great Queen Street, London, W.C.2, 6.45 for 7.45 p.m.

Oct. 20 (*Sat.*).—L.N.E.R. (Great Central) Lecture and Debating Society, at Friends' Meeting House, Sheffield, 4.30 p.m. "Electrical Signalling at Whitemoor Marshalling Yards," by Mr. F. S. Jackson.

Oct. 23 (*Tues.*).—Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. Inaugural Meeting and Address by Mr. Sidney E. Garcke.

Permanent Way Institution (Scottish) at Royal Technical College, George Street, Glasgow, 7.15 p.m. "Portland Blast-Furnace Cement," by Mr. W. R. Wilson.

Oct. 24 (*Wed.*).—Diesel Engine Users' Association, at Caxton Hall, Caxton Street, London, S.W.1, 3 p.m. "Some New Developments in High-Speed Oil Engines," by Mr. P. Belyavin.

Engineers' Economics Study Circle, at Denison House, 296, Vauxhall Bridge Road, London, S.W.1, 7.45 for 8 p.m. "National Congress in Relation to the Monetary System," by Lord Melchett.

Oct. 25 (*Thurs.*).—Institution of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. "The Manufacture of Boiler Tubes," by Mr. G. H. H. Collins.

Institution of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. Inaugural Address by Prof. W. M. Thornton, President.

Oct. 26 (*Fri.*).—Junior Institution of Engineers, 39, Victoria Street, London, S.W.1, 7.30 p.m. "Locomotive Running Shed Economy," by Mr. E. J. H. South.

Institution of Railway Signal Engineers, at Criterion Restaurant, Piccadilly Circus, London, W.1, 6.30 for 7 p.m. Annual Dinner.

L.N.E.R. (York) Lecture and Debating Society, at Railway Inst., Queen Street, 7 p.m. "A Trip Round the World," by Mr. R. S. Dalgliesh.

Oct. 27 (*Sat.*).—Institute of British Foundrymen (Scottish), at Heriot-Watt College, Chambers Street, Edinburgh, 4 p.m. "Some Thoughts on Indian Foundry Production," by Mr. W. T. Bruce.

Oct. 29 (*Mon.*).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, 6.30 p.m. "G.W.R. Route, London to Plymouth," by Mr. D. V. Levien.

Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 8 p.m. "Outstandings," by Mr. D. Hill.

Forthcoming Meeting

Oct. 31 (*Wed.*). **South Indian Railway, Co. Ltd.** (Annual), 91, Petty France, Westminster, S.W.1, at 12 noon.

The Share Market

The stock and share markets have not been so active during the present week owing to activity in the new issue market, which has absorbed fresh funds available for investment. Home railway stocks have been quiet, although the market is mostly firm at former prices. The market is anticipating an early satisfactory outcome of the negotiations for the establishment of new machinery for dealing with disputes in the railway industry. The feature of the week's movements in price has been the rise in the "C" stock of the London Passenger Transport Board.

This has responded to buying by those investors who wish to combine a dividend-paying stock with possible capital appreciation. The "C" stock is regarded as essentially one that is "paying for its keep," whilst offering prospects of a rise to par or over in the event of the full dividend being forthcoming in a future year. The only other movement in price in the early days of the week was a marking down of a point in Mersey 3 per cent. perpetual preference stock, although there was no business recorded at the lower level. Business in home railway ordinary stocks was not very large. The arrangement of options on L.M.S. 1923 preference, London & North Eastern second preference stock and Southern deferred stock points to the directions in which activity is presumably being expected. Option business is not suitable for the ordinary investor, but business in the option market often foreshadows speculative activity on the part of professional interests, either "inside" or "outside." Foreign railway business was quiet. Antofagasta stock, which has recently been rising on account of the improvement in the Chilean nitrate position, was sold at the higher level. Cordoba Central first debenture stock fell a point with business at 32½, the weekly traffic return showing a further decrease. French railway sterling bonds were harder.

It is stated in the market that the issue of the annual reports of the Argentine railways may be delayed until the end of this month owing to certain conversations now proceeding with the Argentine Government. These are believed to have relation to the exchange situation of the railway companies. Costa Rica after touching 30 reacted. Indian railway stocks showed an improvement. Barsi 4 per cent. debenture stock and South Behar 3½ per cent. debentures were marked two points higher in the *Official List*, although no business was recorded at the higher prices. The former reports a traffic decrease, but it is thought this is offset by the reduction in operating expenses mentioned at the recent meeting.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933-34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: Oct. 17, 1934	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	14.10.34	16,160	+ 5,020	41	586,210	440,070	+ 146,140	Ord. Stk.	26	11¾	25½	Nil
	Argentine North Eastern	753	13.10.34	7,512	— 132	15	118,519	151,718	— 33,199	,,	14½	5	9	Nil
	Argentine Transandine	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	Sept., 1934	5,200	— 350	39	54,350	57,200	— 2,850	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13½	315/16
	Buenos Ayres & Pacific	2,806	13.10.34	69,145	— 11,086	15	1,042,972	1,241,836	— 198,864	Ord. Stk.	26	97/16	12	Nil
	Buenos Ayres Central	180	23.9.34	$113,200	+ $3,400	12	$1,583,300	$1,542,000	+ $51,300	Mt. Db.	30	10	23	Nil
	Buenos Ayres Gt. Southern	5,085	13.10.34	113,173	— 35,921	15	1,825,762	2,290,208	— 464,446	Ord. Stk.	44½	21½	28	Nil
	Buenos Ayres Western	1,930	13.10.34	38,056	— 13,839	15	615,476	779,276	— 163,800	,,	34½	15¾	23	Nil
	Central Argentine	3,700	13.10.34	122,679	— 6,534	15	1,862,961	2,019,871	— 156,910	,,	28½	15	17	Nil
	Do.	—	—	—	—	—	—	—	—	Pfd.	18	10	10	Nil
	Cent. Uruguay of M. Video	273	13.10.34	15,471	— 1,252	15	215,822	217,033	— 1,211	Ord. Stk.	20	8	12½	Nil
	Do. Eastern Extn.	311	13.10.34	2,472	— 852	15	43,541	39,332	+ 4,209	—	—	—	—	—
	Do. Northern Extn.	185	13.10.34	1,863	+ 79	15	25,035	24,118	+ 917	—	—	—	—	—
	Do. Western Extn.	211	13.10.34	1,612	+ 46	15	20,057	20,459	— 402	—	—	—	—	—
	Cordoba Central	1,218	13.10.34	25,470	— 10,360	15	472,040	625,770	— 153,730	Ord. Inc.	9¼	2½	4½	Nil
	Costa Rica	188	Aug., 1934	14,974	— 10,765	8	33,155	46,443	— 13,288	Stk.	29	20	30	611/16
	Dorada	70	Sept., 1934	9,200	+ 600	39	89,700	70,200	+ 19,500	I Mt. Db.	76½	68¾	105	511/16
	Entre Rios	810	13.10.34	12,207	+ 1,260	15	169,216	201,889	— 32,673	Ord. Stk.	26½	9	15	Nil
	Great Western of Brazil	1,082	13.10.34	13,500	+ 2,600	41	324,000	388,200	— 64,200	Ord. Sh.	23/6	½	7/8	Nil
	International of Cl. Amer.	794	Aug., 1934	$337,294	+ $41,455	34	$3,360,090	$3,285,984	+ $74,106	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	½	1/16	1/8	Nil
	La Guaira & Caracas	223¼	Sept., 1934	3,045	— 705	39	32,865	46,520	— 13,655	Stk.	16	10	8½	Nil
	Leopoldina	1,918	13.10.34	28,463	— 437	41	1,047,498	1,022,409	+ 25,089	Ord. Stk.	20¼	10	11	Nil
	Mexican	483	7.10.34	$216,200	+ $17,800	14	$3,064,100	$2,557,800	+ $506,300	,,	3	½	2¾	Nil
	Midland of Uruguay	319	Sept., 1934	8,302	+ 933	13	25,851	24,899	+ 952	,,	2	1	1½	Nil
	Nitrate	401	15.10.34	7,824	+ 112	41	194,111	104,938	+ 89,173	Ord. Sh.	78/6	11/16	3/8	Nil
	Paraguay Central	274	13.10.34	3,520	+ 630	15	67,870	54,710	+ 13,160	Pr. Li. Stk.	72	49½	72	85/16
	Peruvian Corporation	1,059	Sept., 1934	63 773	+ 8,411	13	186,438	162,568	+ 23,870	Pref.	15¼	5	10	Nil
	Salvador	100	6.10.34	σ8 910	— σ1,550	14	σ134,647	σ189,373	— σ54,726	Pr. Li. Db.	70	66½	70	71/8
	San Paulo	153½	7.10.34	26,886	— 2,112	40	1,204,700	1,204,789	— 89	Ord. Stk.	102	68	82	47/8
	Taltal	164	Sept., 1934	4 795	— 1,520	13	18,270	13,350	+ 4,920	Ord. Sh.	1¾	5/8	2⅜	5
	United of Havana	1,365	13.10.34	13,396	+ 580	15	251,087	194,025	+ 57,062	Ord. Stk.	8	2	4	Nil
	Uruguay Northern	73	Sept., 1934	1,241	+ 158	13	3,312	3,229	+ 83	Deb. Stk.	6	3½	6½	Nil
Canada.	Canadian National	23,736	7.10.34	665,209	+ 6 604	40	25 057.751	22 301 861	+2,755,890	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4p.c.	Perp. Dbs.	60½	38	76½	51/4
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99¾	85	1o2	315/16
	Canadian Pacific	17,018	7 10.34	521 000	— 36.800	40	18.701 000	16.954,400	+1,746,600	Ord. Stk.	22⅛	11	13	Nil
India.†	Assam Bengal	1,322	15.9.34	24.937	— 1.272	24	637,119	527.285	+ 109,834	Ord. Stk.	79	70	85	3½
	Barsi Light	202	22 9.34	1,995	— 292	25	72,630	72,705	— 75	Ord. Sh.	101¾	70	99·2	6
	Bengal & North Western	2,112	22 9.34	32,420*	— 6 906	25	1,178,378	1,194 346	— 15,968	Ord. Stk.	292	240	283½	558
	Bengal Dooars & Extension	161	22.9.34	3.666	+ 264	25	70,105	69.478	+ 627	,,	127	119	1.6	5916
	Bengal-Nagpur	3,269	15 9 34	97,800	— 2,736	24	2.654,623	2,426 897	+ 227,726	,,	97¼	83½	104½	315/16
	Bombay, Baroda & Cl. India	3,072	6 10 34	140,625	+ 3,075	27	3 991,650	3.807,225	+ 184,425	,,	112	107	112½	55/16
	Madras & South'n Mahratta	3,230	22.9 34	102,975	+ 281	25	2.852,507	2,802,745	+ 49,761	,,	127	114¼	129 2	7
	Rohilkund & Kumaon	546	22.9.34	7,049	+ 607	25	229,852	223 747	+ 6.105	,,	26½	225	252½	6
	South India	2,526	15.9.34	85,645	+ 3,401	24	1,983,280	1,883,291	+ 79 989	,,	119½	112	116½	07/8
Various.	Beira-Umtali	204	Aug., 1934	68 598	+ 25 002	48	587,777	454.875	+ 132,902	—	—	—	—	—
	Bilbao River & Cantabrian	15	Sept., 1934	1,855	+ 225	39	16,195	13,820	+ 2,375	—	—	—	—	—
	Egyptian Delta	621	30.9.34	7.159	+ 1,508	26	105,172	94,478	+ 10,694	Prf. Sh.	15132	13¼	22¼	358
	Great Southern of Spain	104	6 10 34	2,646	+ 99	40	88,030	86,374	+ 1,656	Inc. Deb.	4	3	3½	Nil
	Kenya & Uganda	1,625	Mar., 1934	240 520	+ 21.064	12	638 ,137	606,192	+ 31,945	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33½	44§	715/16
	Mashonaland	913	Aug., 1934	120,007	+ 38 477	48	1,076,622	731.593	+ 345 029	I Mg. Db.	91¾	42	94	55/16
	Midland of W. Australia	277	Aug., 1934	14,055	+ 137	8	25.952	25,857	+ 95	Inc. Deb.	89	70	σ71½	419
	Nigerian	1,905	25.8.34	24,671	+ 4,584	21	546,626	482,675	+ 63,951	—	—	—	—	—
	Rhodesia	1,538	Aug., 1934	197,739	+ 44.558	48	1,810,487	1,340,993	+ 469,494	4 p.c. Db.	98½	80¾	103	376
	South African	13,182	22.9.34	535,115	+ 75,913	25	12,461,248	10,922,901	+1,538,347	—	—	—	—	—
	Victorian	6,172	June, 1934	695,917	+ 61,400	52	9,175,111	9,446,121	— 271.010	—	—	—	—	—
	Zafra & Huelva	112	Aug., 1934	11,147	— 936	34	88,008	85,414	+ 2,594	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

* Traffic dislocated by floods. † Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.